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Vol. 57, No. 8

CONTENTS

August 1982

E. Agius, M.D., F.R.C.Path., D.P.H., Dip.Bact.
K. Apostolov, M.D., Ph.D., Dip. Microbiol.
B. G. Armstrong, B.A., M.Sc.
J. R. Ashton, M.B., B.S., M.Sc., M.R.C.Psych., M.F.C.M.
P. A. Barrow, B.Sc., Ph.D.
A. J. Beale, M.D., F.R.C.Path., F. I. Biol., Dip. Bact.
E. A. Boulter, M.B., B.S.
Professor E. Boyland, Ph.D., D.Sc.
Mrs Carolyn A. Brown, Ph.D.
Professor J. R. Busvine, Ph.D., D.Sc.
H. G. Calwell, M.A., M.D., D.T.M. & H.
C. K. Campbell, M.Sc., Ph.D.
A. B. Christie, M.A., M.D., F.R.C.P., F.F.C.M., D.P.H.
G. W. Crockford, B.Sc., M.I.Biol.
P. B. Crone, M.D., Dip.Bact.
G. W. Csonka, M.D., F.R.C.P., F.R.C.P.(Edin.)
T.S.J. Elliott, Ph.D., B.Tech., B.Med.Sci., M.B., Ch.B.
J. E. Etherton, M.A., Ph.D., M.B., B.Chir., M.I.Biol.
D. W. FitzSimons, B.Sc.
C. M. Angela Gardner, M.Sc.
C. G. Gemmell, B.Sc., Ph.D., M.I.Biol.
E. A. Gould, B.Sc., Ph.D.
D. Greenwood, D.Sc., Ph.D., M.R.C.Path.
Mrs Ann Hawker
R. J. Hay, B.A., B.M., B.Ch., M.R.C.P.
Linda Ho, M.Sc., Ph.D., M.B., B.S.
B. Hofman, M.D.
Professor, P. F. Holt, Ph.D., D.Sc., D.I.C., C.Chem., F.R.I.C., F.I.Biol.
Elizabeth M. Illingworth, B.Sc.
P. A. Jenkins, B.Sc., Ph.D.
F. Jones, M.Sc., B.Tech., M.I.Biol.
W. Kwantes, M.A., M.B., B.Chir., F.R.C.Path., Dip.Bact.
Diana Martin, Ph.D., M.Sc.
C. A. Morris, B.Sc., M.D., Dip.Bact.
W. Norman-Taylor, M.D., M.F.C.M., D.P.H., D.I.H.
R. R. Owen, M.Sc., Ph.D., M.I.Biol., M.R.S.H.
J. S. Oxford, B.Sc., Ph.D.
T. L. Pitt, M.Phil., Ph.D.
Rosemary C. Rogers, M.Sc., Ph.D.
P. W. Ross, *T.D.*, M.D., M.I.Biol.
M. B. Skirrow, Ph.D., M.B., Ch.B., M.R.C.Path., D.T.M. & H.
K. Slatford, B.Sc., M.B., Ch.B., M.R.C.P.
R. N. P. Sutton, M.A., D.M., D.Sc., M.R.C.Path., D.C.H.
A. G. Taylor, B.Sc., M.Phil., Ph.D.
E. Windle Taylor, *C.B.E.*, M.D., D.P.H.
D. Taylor-Robinson, M.D., F.R.C.Path.
D. C. Turk, D.M., M.R.C.P., F.R.C.Path.
Colonel E. E. Vella, B.Sc., M.D., F.R.C.Path., F.I.Biol., D.C.P., D.T.M. & H.
A. Voller, Ph.D., D.Sc.
D. C. Warhurst, B.Sc., Ph.D., M.R.C.Path.
Professor A. P. Waterson, M.D., F.R.C.P.
K. C. Watson, M.D., M.R.C.P.(Edin.)., F.R.C.Path.
Antonnette A. Wieneke, drs.(Holland)
A. E. Wilkinson, M.B., B.S., F.R.C.Path.
R. R. Willcox, M.D., F.R.C.P.
F. J. Wright, M.A., M.D., F.R.C.P., F.R.C.P.(Edin.), D.T.M. & H.
Professor A. J. Zuckerman, D.Sc., M.D., F.R.C.P., F.R.C.Path., D.Obst.R.C.O.G., Dip.Bact.

BUREAU OF HYGIENE AND TROPICAL DISEASES

ABSTRACTS ON HYGIENE AND COMMUNICABLE DISEASES

Vol. 57 1982 No. 8

Environmental Health

WATER AND SEWAGE

2293 PUBLIC HEALTH LABORATORY SERVICE: STANDING COMMITTEE OF ANALYSTS (1981) **A comparison of confirmatory media for coliform organisms and** *Escherichia coli* **in water.** *Journal of Hygiene,* Cambridge **87**(3), 369–375

Nine laboratories in the U.K. Public Health Laboratory Service took part in this two-part investigation involving a total of 1955 positive tube results.

Gas production by coliform organisms and *Escherichia coli* from lauryl tryptose lactose broth (LTLB) was compared with that from brilliant green (lactose) bile broth (BGB). At an incubation temperature of 37°C LTLB and BGB were both satisfactory for gas production, but at 44°C LTLB gave fewer false negative results and was thus significantly less inhibitory than BGB.

The second part of the investigation was the comparison of LTLB with lauryl tryptose mannitol broth (LTMB) as single-tube confirmatory media at 44°C. LTLB gave a high proportion of false negative reactions in the indole test at 44°C. Furthermore, it was shown that LTMB, particularly with tryptophan (0·1 g/l) added to the medium, yielded many more positive results and, in many instances, the indole reactions were stronger. *E. Windle Taylor*

2294 JACQUEMIN, J. L., SIMITZIS-LE FLOHIC, A. M. & CHAUVEAU, N. (1981). Recherche des amibes libres dans l'eau. Etude du réseau d'alimentation en eaux de la ville de Poitiers. **[Free-living amoebae in fresh water. Study of the water supply of Poitiers (France)]** *Bulletin de la Société de Pathologie Exotique et de ses Filiales* **74**(5), 521–524 English summary

Free-living amoebae were found in cultures of 46 out of 76 samples of water from the complete water-supply system of Poitiers. More than 75% of the isolated strains belonged to the genus *Acanthamoeba* and about 25% [no numbers are given] to the genus *Hartmanella;* 2 strains of *Naegleria* sp. were isolated. Tested strains were not sensitive to flucytosine or amphotericin B at normal therapeutic concentrations and also were not pathogenic to mice.

[*Abstr. Hyg.* 1977, **52,** abstr. 2372 and 1982, **57,** abstr. 1960 summarize previous studies by this group in Brest, France.] *D. W. FitzSimons*

2295 Jesenská, Z. & Hrdinová, I. (1982) Mikroskopické huby v povrchových vodách a ich význam pre prax hygienichkej služby. [**Microscopic fungi in surface waters and their importance for the practice of the hygiene service**] *Československá Hygiena* **27**(2), 123–128 [55 references]

2296 Niemi, R. M., Knuth, S. & Lundström, K. (1982) **Actinomycetes and fungi in surface waters and in potable water.** *Applied and Environmental Microbiology* **43**(2), 378–388

These workers have investigated relationships of numbers of actinomycetes and fungi present in raw and treated surface waters and distributed potable waters in Finland with various types of water-treatment processes. They comment on correlations between concentrations of these microorganisms and certain chemical parameters. Reference is also made to run-off from land but no specific mention is made regarding "earthy" excretory metabolites from these organisms. [In my view this may be more important in relation to the number of consumers' complaints received than the actual numbers of bacteria and fungi present throughout the supply system.]

The authors tentatively suggest that a potential health hazard may also exist since piped water can offer a transmission route. They point out that levels of disinfection commonly used in water treatment do not completely eradicate these organisms, which may then produce aftergrowth under certain conditions which could exist in some distribution systems. *F. Jones*

2297 Nestor, I., Lazar, L., Sovrea, D. & Ionescu, N. (1981) **Investigations on viral pollution in the Romanian section of the Danube river during 1972–1977 period.** *Zentralblatt für Bakteriologie I* **173B**(6), 517–527

2298 Annicchiarico, L. S., D'Arca, A. S. & Conte, F. (1981) Reperimenti di *Vibrio parahaemolyticus* e di *Vibrio alginolyticus* in sedimenti marini antistanti la foce del Tevere. [**Finding of *Vibrio parahaemolyticus* and *V. alginolyticus* in sediment in the Tiber estuary, Italy.**] *Nuovi Annali d'Igiene e Microbiologia* **32**(3), 131–145 English summary

Vibrio parahaemolyticus was isolated from 41% of samples and *V. alginolyticus* from 22%. Reports of comparable studies in Europe are discussed (25 references).

2299 World Health Organization (1981) **The risk to health of microbes in sewage sludge applied to land. Report on a WHO Working Group, Stevenage, 6–9 January 1981.** *EURO Reports and Studies 54* 27 pp. WHO Regional Office for Europe, Copenhagen, Denmark [ISBN 92 890 1220 X] [Sw.fr. 4.-]

This Report commences with a useful review of sewage treatments and sludge types before the data on sludge-disposal practices within the EEC countries are reviewed. It highlights discrepancies between national studies into the links between salmonellosis and the land application of sludges. Parasitic infections are also reviewed and the beef tapeworm, *Taenia saginata,* is identified as the most significant parasite that could be associated with disposal on land of sludges. Fungi and viruses are reviewed briefly.

In the context of salmonellosis, the Report indicates that the cycle of transmission in Switzerland certainly involves the use of sludge in agriculture; attempts to break this cycle by changes in meat inspection have failed to reduce the level of human infection and so a concerted effort is being made to break the cycle by disinfection of sludge. In the Netherlands the cycle includes sewage effluents as well as several other factors, whereas, in Britain, septic tank effluents are the only attributable causes of cattle infections. However, as the Working Group points

out, the U.K. evidence is based on the association between clinical reports and outbreaks in cattle whereas in both Switzerland and the Netherlands, epidemiological surveys of human carriers are used as the basis for studies.

The Report contains six recommendations:

(1) Measures should be taken to reduce substantially the concentration of pathogens in sludges applied to crops brought into the kitchen raw.
(2) Adequate time should elapse between the application of sludge and the grazing of animals when the sludge contains pathogens that can contaminate, or multiply in, meat, poultry or dairy products.
(3) Disinfection of sludge should be carried out in order to permit its use with less restriction. The measures suggested are heat treatment, ionizing radiation, prolonged storage and chemical agents.
(4) Digestion or stabilization of sludges should be carried out where it is intended to apply sludge to crops that are not brought into the kitchen raw.
(5) Uniform regulations should not be imposed; local conditions should influence the preparation of guidelines for sludge disposal.
(6) There should be carefully planned epidemiological studies into the relationship between sludge disposal and public health.

In summary, the Report presents a balanced account of the current state of knowledge. There is no suggestion that sludge disposal to land should be prohibited on the grounds of health risks but the need for steps to be taken to reduce concentrations of pathogens is appropriately stressed in specified circumstances. Research needs, although undefined, are apparent and it is to be hoped that this Report will serve as the basis for informed discussion. Perhaps its publication will help to stimulate the research that is essential for filling the gaps in our knowledge. The Working Group should be congratulated for their efforts and the Report merits a wide audience among those concerned with health, agriculture and the treatment of wastes. *R. R. Owen*

ENVIRONMENTAL POLLUTION

2300 Bauer, U. (1981) Blastung des Menschen durch Schadstoffe in der Umwelt – Untersuchungen über leicht flüchtige organische Halogenverbindungen in Wasser, Luft, Lebensmitteln und im menschlichen Gewebe. I. Eigenschaften, Verbreitung und Wirkung leicht flüchtiger Organohalogenverbindungen – Untersuchungsmethodik. **[Human exposure to environmental chemicals – investigations on volatile organic halogenated compounds in water, air, food, and human tissues. I. Properties, distribution, and effects of volatile organic halogenated compounds – analytical procedure]** *Zentralblatt für Bakteriologie I* **174B**(1/2), 15–38 II. Untersuchungsmethodik leicht flüchtiger Organohalogenverbindungen. **[II. Analytical procedure for volatile organic halogenated compounds]** *Ibid.*, 39–56 III. Untersuchungsergebnisse. **[III. Results]** *Ibid.*, (3), 200–237 IV. Bilanzierung der Belastung des Menschen durch Organohalogenverbindungen aus der Umwelt. **[IV. Calculation of human exposure to organic halogenated compounds from the environment]** *Ibid.*, (6), 556–583

The 4-page author's abstract (pp. 15–18) summarizes the 4 papers in this series of articles which relates to the Federal Republic of Germany.

2301 LAFONTAINE, A. (1981) La pollution de l'air et les laboratoires de santé publique. **[Air pollution and public health laboratories]** *Archives Belges de Médecine Sociale, Hygiène, Médecine du Travail et Médecine Légale* **39**(6), 333–367 English summary

2302 WORLD HEALTH ORGANIZATION (1981) **Methods of monitoring and evaluating airborne man-made mineral fibres. Report on a WHO Consultation, Copenhagen, 29 April–1 May 1980.** *EURO Reports and Studies 48* 53 pp. Regional Office for Europe, Copenhagen, Denmark [ISBN 92 890 1214 5] [Sw.fr. 4.-]

INFESTATION

2303 ENGELBRECHT, H. & BUSKE, M. (1982) Zum Vorkommen des tropischen Schimmelplattkäfers *Ahasverus advena* (Waltl, 1832) (Coleoptera, Silvanidae) in modernen Wohnbauten. **[The occurrence of the tropical beetle *Ahasverus advena* (Waltl, 1832) (Coleoptera, Silvanidae) in modern flats]** *Zeitschrift für die gesamte Hygiene und ihre Grenzgebiete* **28**(2), 112–114 English summary

Ahasverus advena [known in Britain as the "foreign grain beetle"] is a minor pest of stored cereals, mainly as a nuisance since it feeds on fungi in damp storage conditions. In recent years (1975–80) there have been numerous complaints of infestation in large new blocks of flats in Potsdam (German Democratic Republic), 300 cases having been reported. Investigations showed that these usually occurred in the first 6 months after completion of the buildings and occupation. Apparently what happened was that insulating materials and the like used in construction caused wall cavities and under-floor spaces to become very humid. Moulds grew and conditions were suitable for proliferation of the beetles, which must have been present in the neighbourhood (possibly favoured by changes in harvesting procedures). As the buildings dried out, owing to central heating, beetles emerged into living rooms and bedrooms, where the lower humidity was harmful to them. Few survived 24 hours and most complaints were about heaps of dead beetles.

With regard to control, improved aeration might help and possibly the addition of fungicide to the insulating materials. Ordinary insecticides will kill the beetles; but in view of their short lives and harmless nature, it is doubtful whether chemical control measures are justified. *J. R. Busvine*

FOOD MICROBIOLOGY

2304 SCHIEMANN, D. A. (1982) **Development of a two-step enrichment procedure for recovery of *Yersinia enterocolitica* from food.** *Applied and Environmental Microbiology* **43**(1), 14–27

"Two new enrichment media were formulated for the recovery of *Yersinia enterocolitica* from foods: (i) yeast extract-rose bengal broth for preenrichment at 4 or 10°C; and (ii) bile-oxalate-sorbose broth, a selective enrichment incubated at 22°C. Comparison of these media in a two-step enrichment procedure against cold enrichment and modified Rappaport broth showed improved and more rapid recovery of human strains of *Y. enterocolitica* from inoculated foods. The use of bile-oxalate-sorbose broth as a selective enrichment also improved the performance of cold enrichment with phosphate-buffered saline. Determination of the best enrichment system for recovery of *Y. enterocolitica* from samples of retail

pork and fresh pork tongues depended on whether the criterion was the number of positive samples, the variety of different serotypes recovered, or the ability to recover the important human serotype O:3. A single enrichment system with the widest selectivity would include preenrichment at 4°C with either phosphate-buffered saline for 14 days or yeast extract-rose bengal broth for 9 days followed by selective enrichment with bile-oxalate-sorbose broth at 22°C for 5 days."

FOOD POISONING

2305 Morbidity and Mortality Weekly Report (1982) **31**(1/2), 3–5. **A food-borne outbreak of streptococcal pharyngitis — Portland, Oregon**

A food-borne outbreak of streptococcal pharyngitis occurred among 820 people who had attended a 3-day meeting at a hotel in Portland, Oregon. An estimated 300 people became ill after a mean incubation time of 24–30 h. β-Haemolytic group A streptococci, T type 9, M negative, SOR positive, were isolated from 26 patients and from 4 throat and 3 skin lesion cultures obtained from 5 of 10 food handlers. Illness was associated with attendance at either of 2 social functions. On both occasions the food included a variety of salads. No food was available for testing and no specific food could be identified as the vehicle of infection.

Antonnette A. Wieneke

2306 Yilmaz, E., Aksoycan, N. & Sağlam, M. (1982) *Salmonella muenster* ile meydana gelen toplu besin zehirlenmesi. [**Food poisoning outbreak caused by** *Salmonella muenster*] *Mikrobiyoloji Bülteni* **16**(2), 111–112

"A food poisoning outbreak caused by *S. muenster* is [very briefly] described. This is the first report on a *S. muenster* food poisoning outbreak in Turkey."

TOXICOLOGY

2307 Norman, J. E. Jr, Robinette, C. D. & Fraumeni, J. F. Jr (1981) **The mortality experience of army World War II chemical processing companies.** *Journal of Occupational Medicine* **23**(12), 818–822

"Tetrachloroethane was used by the [U.S.] Army during World War II in the impregnation of clothing for protection against mustard gas. Thirty-nine chemical processing companies were formed: ten used tetrachloroethane as a solvent for the clothing impregnite and the remainder used a water solvent process. An age-specific analysis of mortality in relation to race, rank, and military occupational specialty was performed in which observed numbers of deaths from principal cause groups were compared with those expected according to U.S. standard mortality rates. Overall cancer mortality for 1,099 white males with tetrachloroethane exposure was 1·26 times that of 1,319 men not involved in the impregnation process. The risks for leukemia, lymphoma, and cancers of the genital organs were moderately elevated, but the numbers were small and no significant excesses were observed."

2308 Perbellini, L., Brugnone, F. & Gaffuri, E. (1981) **Neurotoxic metabolites of "commercial hexane" in the urine of shoe factory workers.** *Clinical Toxicology* **18**(12), 1377–1385

The authors tested urine from 41 shoe-factory workers for metabolites of a mixture of 10 solvents (principally commercial hexane) to which they had been

exposed. Hexane-2,5-dione was the main metabolite (36%) of n-hexane. "This finding of the experimentally proven neurotoxin 2,5-hexanedione in the urine of shoe-factory workers exposed to 'commercial hexane' is consistent with the idea that this compound is responsible for the development of neuropathy in this group of individuals." [See also abstrs 2309 and 2310 below.]

2309 SCELSI, R., POGGI, P., FERA, L. & GONELLA, G. (1981) **Industrial neuropathy due to n-hexane. Clinical and morphological findings in three cases.** *Clinical Toxicology* **18**(12), 1387–1393

"Three cases of motor polyneuropathy due to industrial exposure to an adhesive agent containing 80·4% of n-hexane as the volatile substance are described. . . . Some differences between the present cases and those previously described in the literature are discussed."

2310 CURTES, J P., DEVELAY, P. & HUBERT, J. P. (1981) **Late peripheral neuropathy due to an acute voluntary intoxication by organophosphorus compounds.** *Clinical Toxicology* **18**(12), 1453–1462

The authors report a case of severe acute (and deliberate) intoxication with an alkyl thiophosphate (Folimate). The patient spent nearly 3 weeks in intensive care and then showed late neurological complications (beginning 27 days after the suicide attempt). Recovery took 18 months. *D. W. FitzSimons*

2311 KAROL, M. H. (1981) **Survey of industrial workers for antibodies to toluene diisocyanate.** *Journal of Occupational Medicine* **23**(11), 741–747

"A screening program was undertaken at a research and development facility of a large toluene-diisocyanate (TDI) manufacturing corporation. The purpose was to determine the occurrence of antibodies to TDI in selected worker populations. Sera were obtained at 6-month intervals from 103 employees who were exposed from 6 to 24 months to ambient workplace concentrations of TDI (0·02 ppm or less). With the use of RAST (radioallergosorbent test) containing *p*-tolyl isocyanate-human serum albumin as antigen, no tolyl-reactive IgE antibodies were detected in sera when workers were exposed only to ambient TDI concentrations. During the study, 20 workers had acute exposures to TDI as a result of spills or splashes. Antibody responses developed in three of four individuals whose acute exposures were accompanied by immediate respiratory symptomatology and a decrease in FEV_1 of 20% or greater. By contrast, an antibody response developed in only one of nine workers with immediate respiratory symptoms but not spirometric changes upon acute TDI exposure. No serologic response developed in the remaining workers whose acute exposure resulted in delayed-onset respiratory symptomatology without spirometric changes, or who were asymptomatic at exposure. In persons developing antibodies, an increase in tolyl-reactive IgE was observed within two months of exposure. Routine serologic screening of workers for tolyl-reactive antibodies may be of value in confirming suspected isocyanate exposure and in providing an early warning of developing TDI hypersensitivity."

2312 May, G. (1982) **Tetrachlorodibenzodioxin: a survey of subjects ten years after exposure.** *British Journal of Industrial Medicine* **39**(2), 128–135

2313 Wagner, V., Wagnerová, M., Hřebačka, J., Wokounová, D. & Lambl, V. (1982) Význam biochemických a imunologických změn u dělníků pracujících s vinylchloridem. **[The importance of biochemical and immunological changes in employees working with vinyl chloride]** *Pracovní Lekařství* **34**(4), 129–132

"In 156 workers of a plant producing polyvinylchloride (PVC) the authors examined the levels of immunoglobulins and some other serum proteins. There were either significant decreases in the means of immunoglobulins G (IgG) and alpha 2 macroglobulin (A 2M) or increases in IgA, IgM and lysozyme (LYS) in the exposed persons as compared with controls. The analysis of distribution of the values proved that there were significant shifts even in transferrin (TRF) and ceruloplasmin (CPL). In the exposed persons haemagglutination demonstrated a significantly higher incidence of autoantibodies against the liver tissue. The values exceeding the normal limits (i.e. deviations exceeding ± 2 standard deviations) in one test were about the same frequency in the exposed and control persons (30–40%), but the occurrence of values outside a normal limit in two or three tests at the same time was significantly more frequent in the exposed group in comparison with the controls."

2314 Kruse, A., Borch-Johnsen, K. & Pedersen, L. M. (1982) **Cerebral damage following a single high exposure to carbon disulphide.** *Journal of the Society of Occupational Medicine* **32**(1), 44–45

"A formerly healthy 48-year-old man was accidentally exposed for approximately 20 minutes to a high concentration of carbon disulphide (minimum concentration, 400 parts/10^6, maximum, 470 000 parts/10^6), and was unconscious for approximately 10 minutes. Serious persistent cerebral deterioration developed. Computerized tomography scanning showed cerebral atrophy, neuro-psychological examination established dementia, and measurement of cerebral flow showed reduced cortical flow in the right hemisphere.

"Possible mechanisms for the cerebral damage are discussed, and persons who are at risk from such accidental poisoning are listed."

2315 Sivitskaya, I. I. (1982) **[Effects of pesticides on eyes]** *Gigiena Truda i Professional'nye Zabolevaniya* (4), 32–35

"Eye functions (pressure in the central artery of the retina, tonography, lability, sensitivity of the retina, adaptation) were examined in persons occupationally exposed to pesticides, i.e. to tetraethyl thiuram disulfide, hexachlorocyclohexane, and polychloropinene during their synthesis and packing. Characteristic correlations were detected between shifts in various functions and clinical manifestations, that should be taken into consideration in diagnosing the disease, especially the early forms of disturbances."

VENOMS AND ANTIVENOMS

2316 Golden, D. B. K., Langlois, J., Valentine, M. D., Kagey-Sobotka, A. & Lichtenstein, L. M. (1981) **Treatment failures with whole-body extract therapy of insect sting allergy.** *Journal of the American Medical Association* **246**(21), 2460–2463

"Whole-body extracts (WBEs) remain in widespread use for therapy of insect

sting anaphylaxis two years after the approval of Hymenoptera venoms. We have reviewed our experience with WBEs in our patient population. Of 250 patients who received WBE, 115 had subsequent stings. Systemic allergic reactions occurred in 65%, large local reactions in 23%, and no reaction in 12%. There was no consistent change in the severity of systemic reactions during WBE treatment. Systemic reactions occurred less commonly in younger persons or after at least two years of WBE treatment. We conclude that WBE is not effective for the prevention of allergic insect sting reactions. The natural history of the disease may account for its apparent efficacy in young people or those having prolonged WBE therapy. Venom immunotherapy is safe and rapidly effective and is the only protective treatment recommended."

OCCUPATIONAL MEDICINE—GENERAL

2317 KURPPA, K. [Guest Editor] (1982) **Proceedings of the First Symposium on Epidemiology in Occupational Health, Helsinki, Finland, 10–12 June 1981.** *Scandinavian Journal of Work, Environment and Health* **8**(Suppl. 1), 184 pp.

The symposium at which this collection of papers was presented was held under the auspices of the Permanent Commission and International Association on Occupational Health to "provide a formal forum for epidemiologists engaged in occupational health problems." Thirty five papers are included, dealing with methodological issues in occupational epidemiology, and presenting and discussing results from relevant studies.

The first 10 papers, including the honorary guest lecture of O. MIETTINEN (p. 7), directly address general methodological questions. Other papers present studies of cancer, diseases of the musculoskeletal system, lung disorders, and neurotoxicity. The effects of exposure to asbestos, radiation, cadmium, solvents, lead, mercury, and synthetic oestrogens are discussed, as is the health status of chimney sweeps, luggage handlers, construction workers, steel welders, and poultry slaughter-house workers.

Most of the substantive findings on the aetiology of disease presented in this volume will probably be published elsewhere, but discussion of methodological issues may be less full in these later publications. It is possible that the collection will be found most useful for such discussion, and for the direct treatment of questions of method in the first 10 papers. There are many unresolved issues on appropriate design, analysis, and interpretation of occupational epidemiological studies. These papers make a significant contribution to the clarification of some of these issues.

The relative lack of papers from North America, and the total absence of papers from the eastern European countries somewhat upset the representativeness of the proceedings as a sample of occupational epidemiology being carried out over the world.

B. G. Armstrong

2318 TABOR, M. (1982) **Women in coal mines: PPE, where are you?** *Occupational Health and Safety* **51**(1), 22–26, 50

This paper first refers to the problems that a particular woman has in finding protective clothing and work wear that fits. It states that her problems are not unique. She is, say, 5 feet 1 inch tall and weighs 200 pounds! — perhaps not unique but a person who is obviously at the extreme ends of the range of variability is not a good example on which to base a case for improved PPE [personal protective equipment]. Such people will always need "one off jobs" and the main problems of fit and design apply to the garments and equipment which

are intended for and are worn by the average ± 1 SD and where an inch or a fraction of an inch in a dimension makes the difference between the garment or item fitting and not fitting, comfort and discomfort. We are therefore up against production problems and economics as well as applied ergonomics. However, the increasing number of women in industry is presenting employers, safety officers and the PPE manufacturers with problems and this paper graphically illustrates some of them. Many of the problems are well known but management and safety officers in companies taking on more women for traditionally male occupations will find this paper worth reading. *G. W. Crockford*

2319 COSSET, J. C., BUTAT, C., GAUCHER, P. *et al.* (1981) Travail et maternité dans les Pays de Loire et de Bretagne (à propos d'une enquête). **[Work and maternity in the Loire region and in Brittany (concerning a survey)]** *Archives des Maladies Professionnelles de Médecine du Travail et de Sécurité Sociale* **42**(4), 220–225

This enquiry is based on 962 replies to a questionnaire given to mothers returning to work after maternity leave. Particularly it looks at the amount of extra leave taken, and when, and the relationship of this to "hypotrophy" or prematurity (though not including spontaneous abortions). The questions covered, in addition to age, parity, spacing of pregnancies and the like, such things as means of transport to work, the time taken in travelling, the number of workers in the factory, special arrangements for expectant mothers in the factory, working posture, and the presence of industrial hazards or hard work.

There are some interesting correlations: for example half the women whose travel time exceeded an hour took an extra month's maternity leave, and over half of these had premature babies, although the *type* of travel had no effect on the outcome. Women working in medium sized enterprises (10 to 50 employees) appear to take most leave and also have the highest prematurity rates, and the same applies to factories which do not make special arrangements for mothers, and to work involving a lot of walking about or a poor "social climate." Where the work is heavy the child itself is apparently unaffected but such women take more leave. Married mothers take more leave than the unmarried, but the latter are more likely to have premature or underweight babies. *W. Norman-Taylor*

2320 WALLACE, R. (1982) **The New York City fire epidemic as a toxic phenomenon.** *International Archives of Occupational and Environmental Health* **50**(1), 33–51

"We have found that the percent of the fire-fighting work force retiring under disability in New York City appears, at first approximation, to follow a classic dose-response relation with per capita structural fire work load over the period 1960–1978. . . ."

OCCUPATIONAL DISEASES

2321 CHOVIL, A. C., MCCRACKEN, W. J., DOWD, E. C., STEWART, C., BURTON, D. F. & DYER, D. W. (1981) **Occupational cancer: experience in Ontario.** *Canadian Medical Association Journal* **125**(11), 1237–1241

The experience of the Workmen's Compensation Board indicates that less than 1% of all cancer in Ontario is caused by occupational factors. In the past decade there have been about 30 cases per annum of accepted claims for compensation on account of cancer. Most of the occupational cancers were in the lung.

E. Boyland

2322 PETO, J., SEIDMAN, H. & SELIKOFF, I. J. (1982) **Mesothelioma mortality in asbestos workers: implications for models of carcinogenesis and risk assessment.** *British Journal of Cancer* **45**(1), 124–135

This paper describes a statistical study of 236 deaths from mesothelioma among 17 800 members of the International Association of Heat and Frost Insulators and Asbestos Workers, previously reported by SELIKOFF *et al. (Annals of the New York Academy of Sciences* 1979, **330,** 91). The risk of dying from mesothelioma for these workers has been studied in relation to the age at the first exposure to asbestos. The mesothelioma death rate appears to be proportional to the 3rd or 4th power of time from first exposure. Age at first exposure, therefore, has little influence on the risk. *P. F. Holt*

2323 CHOVIL, A., SUTHERLAND, R. B. & HALLIDAY, M. (1981) **Respiratory cancer in a cohort of nickel sinter plant workers.** *British Journal of Industrial Medicine* **38**(4), 327–333

In 495 nickel refinery workers employed between 1948 and 1962 in Ontario, Canada, 54 cases of lung cancer and 8 of sinus cancer were seen. The present risk is much less than it was when the plant was started. *E. Boyland*

2324 WATANABE, H., MISHINA, T., OHE, H., ARAKI, H. & NAKAO, M. (1981) **A clustering of prostatic cancer in an area with many manganese mines.** *Tohoku Journal of Experimental Medicine* **135**(4), 441–442

"In the process of our mass screening trials for prostatic diseases, a significant clustering of prostatic cancer in a town in the suburbs of Kyoto was detected. Upon survey a possible association was found between the location where the patients lived and the manganese ore deposits distributed in the town."

2325 ANDERSEN, P., CHRISTENSEN, K. M., JENSEN, B. E. *et al.* (1982) **Antibodies to pigeon antigens in pigeon breeders: detection of antibodies by an enzyme-linked immunosorbent assay.** *European Journal of Respiratory Diseases* **63**(2), 113–121

2326 AGATHOS, M. & BERNECKER, H. A. (1982) Handdermatitis bei medizinischem Personal. **[Dermatitis of the hands among medical personnel]** *Dermatosen in Beruf und Umwelt* **30**(2), 43–47

". . . The most frequent allergen in 114 cases of eczema of the hands in medical personnel between 1976 and 1980 at the Department of Dermatology and Allergology of the Municipal Hospital Schwabing in Munich was formaldehyde in 24 instances (i.e. 21%), thiuram mix in 18 (i.e. 16%) and nickel sulfate in 15 (i.e. 13%)."

2327 HENDRICK, D. J. & FABBRI, L. (1981) **Compensating occupational asthma.** [Editorial] *Thorax* **36**(12), 881–884 [38 references]

Occupational asthma became a prescribed disease in Britain early in 1982.

See also abstr. 2345.

Community Health

FAMILY HEALTH

2328 Zsolnai, B. (1982) Anyai halálozás 1980-ban. **[Maternal mortality in 1980]** *Népegészségügy* **63**(2), 65–71

"In 1980 there were 38 maternal deaths [$15{\cdot}2/10^4$] in connection with 249,443 obstetrical cases . . . in Hungary. . . ."

2329 Kelsey, M. C., Lipscomb, A. P. & Mowles, J. M. (1982) **Limulus amoebocyte lysate endotoxin test: an aid to the diagnosis in the septic neonate?** *Journal of Infection* **4**(1), 69–72

Blood and cerebrospinal fluid from 19 neonates of 33 weeks mean gestational age were tested for the presence of bacterial endotoxin by the *Limulus* amoebocyte lysate assay. Each neonate was assigned to one of three classes on clinical and microbiological criteria. Endotoxin was not detected in any of the 4 babies in group 1, in whom there was no clinical or other evidence of infection. Endotoxin was detected in the cerebrospinal fluid (CSF) of 4 of the 11 babies in group 2; two of these infants had abnormalities of the large bowel (necrotizing enterocolitis and volvulus) probably resulting in endotoxin release to the circulation. In Group 3, all 4 infants had proven infections, 3 of them with Gram-negative bacteria, and all of them had endotoxin in the CSF. It is concluded that the *Limulus* lysate test on CSF is clinically useful in neonates. *Curtis G. Gemmell*

2330 Eyal, F., Sagi, E., Arad, I. & Avital, A. (1982) **Necrotising enterocolitis in the very low birthweight infant: expressed breast milk feeding compared with parenteral feeding.** *Archives of Disease in Childhood* **57**(4), 274–276

"The incidence of necrotising enterocolitis (NEC) in very low birthweight infants (VLBW $\leqslant$ 1500 g) was reduced by the delayed onset of enteral feeding. Eight (18%) out of 44 VLBW infants who were in hospital during the first year of the study developed NEC. During the next 12 months 85 similar infants were initially fed by parenteral nutrition only, and then from age 14–21 days with infant formula. During the second year only 3 (3%) patients developed NEC. There were no other relevant changes in management. Throughout the entire study, the onset of NEC in each infant in whom it occurred was after the start of enteral feeding. We recommend avoiding enteral feeding in VLBW infants during the period that they are particularly vulnerable—namely the first 2 or 3 weeks of life."

2331 Read, D. J. C., Jeffery, H. E. & Rahilly, P. (1982) **Sudden infant death syndrome and suspected "near miss": an overview for clinicians.** *Medical Journal of Australia* **1**(2), 82–86

"SIDS (Sudden Infant Death Syndrome) is the most common cause of death in young infants in Australia. Yet its cause is not known. This paper reviews the main theories about SIDS, suggests ways of managing 'near-miss' SIDS infants, and outlines a regimen for parents' support and grief counselling."

2332 Shannon, D. C. & Kelly, D. H. (1982) **SIDS and near-SIDS. [Part 1]** *New England Journal of Medicine* **306**(16), 959–965 **[Part 2]** *Ibid.*, (17), 1022–1028

2333 Barkin, R. M., Hartley, M. R. & Brooks, J. G. (1981) **Influence of high altitude on sudden infant death syndrome.** *Pediatrics* **68**(6), 891–892

To assess the possible role of chronic hypoxia in human infants, the authors studied the effect of high altitude on the occurrence of sudden infant death syndrome. The fact that the number of deaths due to the sudden infant death syndrome was not increased indicated that high altitude is probably not an independent risk factor. *C. M. Angela Gardner*

2334 Fergusson, D. M., Horwood, L. J., Shannon, F. T. & Taylor, B. (1981) **Parental smoking and lower respiratory illness in the first three years of life.** *Journal of Epidemiology and Community Health* **35**(3), 180–184

The rates of lower respiratory illness during the first year of life are linearly related to maternal smoking. An increase of 5 cigarettes per day is linked to an increase of 2·5 to 3·5 instances of lower respiratory illness per 100 children at risk. The effect disappears by the 3rd year of life, and there is no correlation at any time with paternal smoking or special factors.

These findings arose out of a well controlled 3-year study of 1265 New Zealand children. Only 122 had dropped out of the study by the end. *J. E. Etherton*

2335 Buck, C. & Simpson, H. (1982) **Infant diarrhoea and subsequent mortality from heart disease and cancer.** *Journal of Epidemiology and Community Health* **36**(1), 27–30

CARE OF OLD PEOPLE

2336 Arie, T. [Editor] (1981) **Health care of the elderly: essays in old age medicine, psychiatry and services.** 240 pp. Croom Helm Ltd., 2–10 St John's Road, London SW11 [ISBN 0 7099 0252 2] [£15.50]

One of the unsung benefits of the National Health Service in the U.K. has been the painstaking work done by British geriatricians and psychiatrists to chart the health and medical and social needs of the elderly in a systematic fashion. In part too this is a product of the tradition of social medicine in Britain.

This book is one of the fruits of that work, most of the contributors having developed their skills and knowledge within the National Health Service where the realities of provision of care for all the elderly irrespective of wealth have provided the bed-rock for a substantial knowledge and understanding.

The contributions are in a sense optimistic. There is a difficult task ahead because of the demographic trends that are already with us, but despite this the work drawn on in these chapters points the way to a rational, humane and equitable approach to the care of the elderly provided that there is an adequate commitment in social policy.

The book is presented as a series of essays rather than purely scientific papers. In the main these essays are very readable and provide much food for thought. Taken as a whole, the book should form the basis for policy discussions by many interested groups and organizations. I wholeheartedly recommend this volume. *John Ashton*

2337 Dalgaard, O. Z. & Rosenbeck-Hansen, J. [Guest editors] (1982) **The elderly in Denmark: demographic, economic, social and health conditions.** *Danish Medical Bulletin* **29**(3), 89–168

2338 Burr, M. L., Milbank, J. E. & Gibbs, D. (1982) **The nutritional status of the elderly.** *Age and Ageing* **11**(2), 89–96

"Data are presented relating to the nutritional status of over 15000 elderly subjects seen in three community surveys. There was a decline in weight, arm circumference and skinfold thickness with advancing age. Haemoglobin levels declined with age in one area but not in the others, probably due to differences in nutritional state. Plasma protein and albumin concentrations showed no decline with age and were similar to values reported from younger subjects. Men who ate alone tended to have a poorer vitamin C and thiamine status than men whose meals were cooked or shared by another person, but no such difference was found among women: indeed, women eating alone had significantly higher leucocyte ascorbic acid levels."

2339 Klabusay, L., Blaha, M., Hrnčířová, L. & Jedlička, V. (1982) Akutní bakteriální zánět plic ve stáří. **[Acute bacterial pneumonia in old people]** *Časopis Lékařů Českých* **121**(13), 395–398

NUTRITION

2340 Schulpen, T. W. J. (1982) Opnieuw rachitis in Nederland. **[Rickets, back in the Netherlands]** *Nederlands Tijdschrift voor Geneeskunde* **126**(14), 610–613

"Reference is made to the return of rickets due to deficiency of vitamin D, in children of immigrant labourers but also in children fed strict vegetarian diets. The prophylaxis and treatment of this disease, the incidence of which appears to be increasing, are discussed. An educative campaign appears to be necessary."

See also abstr. 2338.

DRUG ABUSE

2341 Sherlock, S. [Scientific Editor] (1962) **Alcohol and disease.** *British Medical Bulletin* **38**(1), 1–114

This collection of papers is described in the editor's introduction as an attempt "to cross the disciplinary boundaries and to give a spectrum of the effects of alcohol in man." In addition to providing something for everyone who may come across problem drinking in their professional work it is suggested that there is even something for the layman who can "read for himself what a scourge alcohol abuse has become, and how widespread and devastating are its effects." The papers are written by numerous specialists in the fields of gastroenterology, psychiatry, psychology, cardiology, hepatology, nutrition and pathology and provide a detailed investigation of the damage caused to the human body by excessive use of alcohol. Three papers devoted to treatment concentrate on alcohol dependence, withdrawal and long-term treatment of the psychological effects.

The value of such a collection of papers is not only in their individual merits but in the range of topics which are covered. For anyone medically associated with alcoholics and faced with choosing the most appropriate treatment facilities the physical effects of alcohol abuse are clearly and coherently set out. This type of publication is also of use to members of the paramedical professions who, although

obviously are not in a position to treat physical symptoms, may find it helpful to develop an awareness of the dangers of physical damage. Each paper is headed by concise notes which outline the subject matter and enable the reader to ascertain that the contents are relevant to his own particular interests.

In spite of the claim that this is a book for everyone it does in fact appear to be directed towards those who have at the least a minimal knowledge of the alcohol field. However the layman might absorb the fact that relatively low amounts of alcohol consumption do in some cases produce liver damage. This alone might produce some effect on the habitual 10-pint-a-day man who boasts not only of his intake but of his state of health.

This surely is a publication that is essential for medical and specialist libraries and makes a valuable contribution to the literature on alcohol and alcoholism.

Ann Hawker

2342 MURRAY, R. M. & GURLING, H. M. D. (1982) **Alcoholism: polygenic influence on a multifactorial disorder.** *British Journal of Hospital Medicine* **27**(4), 328–334 [46 references]

2343 CUTTING, J. (1982) **Alcoholism: neuropsychiatric complications of alcoholism.** *British Journal of Hospital Medicine* **27**(4), 335–342 [41 references]

2344 SILLANPÄÄ, M. L. (1982) **Alcoholism: treatment of alcohol withdrawal symptoms.** *British Journal of Hospital Medicine* **27**(4), 343–350 [56 references]

2345 COVEY, L. S. & WYNDER, E. L. (1981) **Smoking habits and occupational status.** *Journal of Occupational Medicine* **23**(8), 537–542

Reports of occupational diseases that do not take into account the smoking habits of the workers concerned cannot be accepted as accurate. Reliable studies should include information on smoking habits, current or past duration, daily amount and tar yield. Information simply on whether the subject has ever or never smoked, and the daily amount smoked, is not enough by itself.

This conclusion was drawn from a study of 2528 white men who were admitted to hospital for non-tobacco-related diseases. Some specific findings were that non-college-educated men started smoking earlier, smoked more per day, used high-tar cigarettes and were relatively unlikely to be ex-smokers compared with highly educated men. None of the physicians among the latter group smoked high-tar cigarettes, but among those who did smoke there were some who smoked more than 30 per day. The highest percentage of ex-smokers (89%) was found among religious workers.

J. E. Etherton

2346 TAHA, A., BALL, K. P. & ILLINGWORTH, R. D. (1982) **Smoking and subarachnoid haemorrhage.** *Journal of the Royal Society of Medicine* **75**(5), 332–335

"An enquiry was made into the smoking habits of 199 patients who had survived a subarachnoid haemorrhage (SAH). Information was obtained from 189, giving a 95% response rate. Those with a cerebral aneurysm had on average smoked considerably more cigarettes daily than those with arteriovenous malformations (AVM) or with normal angiographic findings (NAF) whose smoking habits were

similar to those of the UK population. SAH due to cerebral aneurysm should be considered another smoking-related disease."

See also abstr. 2334.

VITAL STATISTICS AND HEALTH REPORTS

2347 Office of Population Censuses and Surveys (1982) **Cancer statistics registrations: cases of diagnosed cancer registered in England and Wales, 1977.** *Series MB1(8),* pp. xiv + 71. H.M. Stationery Office, London [ISBN 0 11 690908 0] [£7.40]

2348 Office of Population Censuses and Surveys: Communicable Disease Surveillance Centre of the Public Health Laboratory Service (1982) **Communicable disease statistics, 1980, England and Wales.** *Series MB2(7),* pp. xxiv + 47. H.M. Stationery Office, London [ISBN 0 11 690907 2] [£6.20]

2349 Minette, A. (1981) L'activité de l'Institut d'Hygiène des Mines en 1980. **[Work of the Institut d'Hygiène des Mines: report for 1980]** Reprinted from *Annales des Mines de Belgique* (10), 853–872

Diseases and their Control

CHRONIC CARDIO-RESPIRATORY DISEASES

2350 Nicholls, E. S., Jung, J. & Davies, J. W. (1981) **Cardiovascular disease mortality in Canada.** *Canadian Medical Association Journal* **125**(9), 981–992

2351 Hallenbeck, W. H., Brenniman, G. R. & Anderson, R. J. (1981) **High sodium in drinking water and its effect on blood pressure.** *American Journal of Epidemiology* **114**(6), 817–826

See also *Abstr. Hyg.* 1980, **55,** abstr. 4057.

2352 Dyer, A. R., Stamler, J., Shekelle, R. B. *et al.* (1982) **Pulse pressure. I. Level and associated factors in four Chicago epidemiologic studies.** *Journal of Chronic Diseases* **35**(4), 259–273 **II. Factors associated with follow-up values in three Chicago epidemiologic studies.** *Ibid.,* 275–282 **III. Prognostic significance in four Chicago epidemiologic studies.** *Ibid.,* 283–294

NEOPLASTIC DISEASES

2353 International Agency for Research on Cancer (1981) **IARC monographs on the evaluation of the carcinogenic risk of chemicals to humans. Vol. 26. Some antineoplastic and immunosuppressive agents.** 411 pp. Distributed for IARC by WHO, Geneva, Switzerland [ISBN 92 8 321226 6] [Sw.fr. 62.-]

The 26th IARC Working Group on the evaluation of carcinogenic risks was larger than that of previous occasions; there were 24 members and 16 persons in the secretariat. The 18 substances considered were 5-azacytidine, azathioprine, bis(chloroethyl)nitrosourea (BCNU), bleomycins, chlorambucil, 1-(2-chloroethyl)-3-cyclohexyl-1-nitrosourea (CCNU), cisplatin, cyclophosphamide, dacarbazine, 5-fluorouracil, isophosphamide, 6-mercaptopurine, methotrexate, prednisone, procarbazine hydrochloride, treosulphan, vinblastine sulphate and vincristine sulphate.

All these substances, except azathioprine which is used in the treatment of autoimmune diseases and to prevent rejection of transplanted organs, are used in the treatment of cancer. Isophosphamide, 6-mercaptopurine and prednisone are also used as immunosuppressive drugs. At least 11 of the substances were mutagenic and have induced tumours or leukaemia in rodents and "should be regarded for practical purposes as if they presented carcinogenic" risks to humans and some 4 are considered to have caused cancer in patients. 12 of the products were teratogenic in animals.

In many cases the evaluation of risk to humans was difficult to assess because patients are treated with combinations of drugs. Many of the materials used for immunosuppression and treatment of cancer are carcinogenic. *E. Boyland*

See also abstr. 2324.

2354 Flanders, W. D. & Rothman, K. J. (1982) **Interaction of alcohol and tobacco in laryngeal cancer.** *American Journal of Epidemiology* **115**(3), 371–379

"Both alcohol and tobacco use are accepted risk factors for laryngeal cancer. The authors used case-control data from previous studies to estimate the value of a previously proposed index of interaction between these two risk factors. In addition to the weighting procedure over exposure categories that was previously proposed for estimating a summary index, they applied maximum-likelihood techniques to facilitate the estimation. Overall, they found moderate synergy between alcohol and tobacco in increasing the risk of laryngeal cancer, in that exposure to both factors increased the risk about 50% more than the increase predicted if the effects of tobacco and alcohol were simply additive."

2355 Floersheim, G. L., Grundmann, H. P., Looser, R. & Meyer, J. C. (1982) **Inhibition of growth of human cancers by extracts from** *Trichophyton verrucosum. Lancet* **i**(Mar. 27), 708–710

"Lyophilised extracts from cultured dermatophytes were injected into mice carrying rapidly proliferating xenografts of a human Ewing sarcoma or a human colon carcinoma. Extracts from strains of *Trichophyton verrucosum* greatly inhibited the growth of both tumours. There were no overt signs of toxicity."

2356 Stiller, C. A. & Draper, G. J. (1982) **Trends in childhood leukaemia in Britain 1968–1978.** *British Journal of Cancer* **45**(4), 543–551

"Analysis of recent cancer registrations from Great Britain suggests that there has been an increase in the incidence of childhood acute lymphoid leukaemia for

children born after about 1964. The increase is statistically significant for boys aged 0–4 years, and a lesser increase may also have occurred for girls in this age group. Reasons are given for believing that the increase is not purely an artifact attributable to improved registration procedures. Registration data from the Manchester Children's Tumour Registry, Denmark and Sweden support the suggestion that an increase has occurred.

"It is not at present possible to say whether a change in incidence will also be seen at higher ages or will be confined to the youngest children, who may represent an aetiologically distinct sub-group. There is no obvious explanation for the findings reported here."

See also abstrs (2335), (2347), 2383, (2511), (2525), 2528, 2555, 2556.

HAEMATOLOGY

2357 BLOUQUIT, Y., BEUZARD, Y., VARNAVIDES, L. *et al.* (1982) **Antenatal diagnosis of haemoglobinopathies by Biorex chromatography of haemoglobin.** *British Journal of Haematology* **50**(1), 7–15

"Biorex chromatography of haemoglobin has been compared to the standard chromatographic separation of radioactive globin chains in 60 fetal blood samples obtained for the antenatal diagnosis of haemoglobinopathies. Biorex chromatography of haemoglobin permitted two measurements, the optical density at 418 nm and the radioactivity incorporated into fetal and adult haemoglobin. The two measurements were highly correlated (r^2=0·96) and enabled a distinction between homozygous from heterozygous states of the diseases to be made, particularly in β thalassaemia. A single column was used for 50 analyses. This fast and very sensitive method is proposed for the antenatal diagnosis of haemoglobinopathies using fetal blood."

OTHER NON-COMMUNICABLE DISEASES

2358 i. WENSINCK, F., CUSTERS-VAN LIESHOUT, L. M. C., POPPELAARS-KUSTERMANS, P. A. J. & SCHRÖDER, A. M. (1981) **The faecal flora of patients with Crohn's disease.** *Journal of Hygiene,* Cambridge **87**(1), 1–12

ii. WENSINCK, F. & VAN DE MERWE, J. P. (1981) **Serum agglutinins to *Eubacterium* and *Peptostreptococcus* species in Crohn's and other diseases.** *Ibid.,* 13–24

iii. VAN DE MERWE, J. P., SCHMITZ, P. I. M. & WENSINCK, F. (1981) **Antibodies to *Eubacterium* and *Peptostreptococcus* species and the estimated probability of Crohn's disease.** *Ibid.,* 25–33

i. "The faecal flora of patients with Crohn's disease was compared with that of healthy subjects. In patients with terminal ileitis, numbers of anaerobic gram-negative and coccoid rods (species of *Eubacterium* and *Peptostreptococcus*) were higher than in the controls whereas anaerobic gram-positive rods and cocci and aerobes occurred in normal numbers. The composition of the flora was neither influenced by duration of the disease nor by ileocaecal resection. In healthy subjects and patients, a chemically defined diet induced only slight changes in the flora. Thus, the flora in terminal ileitis although stable was permanently abnormal.

"In patients with Crohn's colitis, abnormally low numbers of anaerobes were found in patients with severe, bloody diarrhoea while aerobic counts were normal.

The flora in patients with mild colitis was similar to that in terminal ileitis. It is suggested that the abnormal flora composition might be an expression of the genetic predisposition to Crohn's disease."

ii. "Sera from patients suffering from Crohn's and other diseases and from healthy subjects were tested for agglutinins to anaerobic, gram-positive coccoid rods belonging to species of *Eubacterium* and *Peptostreptococcus*. Four strains labelled *Eubacterium contortum* (two strains), *Eubacterium rectale* and *Peptostreptococcus productus* were agglutinated by a higher percentage of sera from patients with Crohn's disease than from healthy subjects and from patients with liver and intestinal diseases (including ulcerative colitis), ankylosing spondylitis, granulomatous diseases, diseases of immunity and malignancies.

"The agglutinins were of the IgG and IgM classes and strain-specific; the titres were low.

"The results obtained with sera from patients with Crohn's disease and healthy people were subjected to discriminant analysis to estimate the probability, based on the combined results with the four strains, that a patient suffers from Crohn's disease. When sera giving an *a posteriori* probability $\geq 0{\cdot}95$ (*a priori* probability $= 0{\cdot}5$) were considered positive, the test with four strains had a sensitivity of 54% and a specificity of nearly 100%. The results with sera submitted for diagnosis showed that positive reactions in patients with a diagnosis apparently incompatible with Crohn's disease were within acceptable limits."

iii. "Anaerobic coccoid rods belonging to species of *Eubacterium* and *Peptostreptococcus* agglutinate more frequently with sera from patients with Crohn's disease than with sera from patients suffering from other diseases and from healthy subjects. Results of agglutination tests with four strains of coccoid anaerobes were used to estimate the probability that a patient suffers from Crohn's diease. The data on healthy subjects and patients with Crohn's disease were subjected to logistic discriminant analysis. With the methods and interpretation described, 52% of the patients with Crohn's disease were recognized as 'definite' or 'probable' Crohn's disease and 14% as 'suspected'. Only 1% of the healthy subjects were classified as 'suspected' and none as 'definite' or 'probable' Crohn's disease."

COMMUNICABLE DISEASES—GENERAL

2359 BALL, A. P. [Editor] (1982) **Notes on infectious diseases.** pp. xii + 263. Churchill Livingstone, 1–3 Baxter's Place, Leith Walk, Edinburgh EH1 3AF [ISBN 0 443 02424 3] [£4.50]

This excellent book provides a concise but comprehensive account of communicable disease and will be a useful source of information to those interested in the subject. The basic epidemiological and pathogenic concepts of infectious diseases are clearly described in the first chapter, which also includes the pathophysiology of infection and the response of individual organs. This introduction will enable the reader to obtain a better understanding of the diseases that are described in the following sections.

Each of the next chapters deals with defined diseases including measles, rubella, mumps, varicella zoster and herpes simplex. Chapters on meningitis, hepatitis, streptococcal and staphylococcal diseases, upper respiratory tract infections, glandular fever, diphtheria and whooping cough follow. The epidemiology, clinical microbiology and clinical features, including management and complications of each of the diseases, are described. There is also a chapter on atypical pneumonia and Legionnaires' disease which informs the reader of the more recent develop-

ments in this changing field of microbiology. Other chapters deal with gastrointestinal infections, botulism, tetanus, zoonosis, rabies and imported diseases. In addition, there is a useful chapter on infection in hospital patients. The pathogens, routes of transmission and control associated with hospital infections are all described in this chapter. The final section discusses the clinician and the microbiology laboratory. This chapter will facilitate a better understanding of the hospital environment by junior doctors and will encourage communication between clinicians and laboratory, resulting in an improved service for the patient.

In summary, this book is highly recommended to both clinical medical students and junior doctors. It provides a good level of information and should stimulate further reading. (A list of books and publications recommended for further reading is given.) The authors are to be congratulated. *T. S. J. Elliott*

2360 Good, R. A. & Day, S. B. [Series Editors] (1982) *Comprehensive Immunology Vol. 9.* **Immunology of human infection. II. Viruses and parasites; immunodiagnosis and prevention of infectious diseases.** [Nahmias, A. J. & O'Reilly, R. J. Editors] pp. xxvii + 603. Plenum Publishing Corporation, 233 Spring Street, New York, N.Y. 10013, U.S.A. [ISBN 0 306 40258 0] [U.S. $45.00]

Volume 9 of the series *Comprehensive Immunology* covers the immunological aspects of viral and parasitic diseases of man. Volume 8 dealt with the immunology of infections due to bacteria, mycoplasmas, chlamydiae and fungi [*Abstr. Hyg.* 1982, **57,** abstr. 806]. The present companion text is based on a similar format and approaches each topic by considering the biological processes that contribute to infection, the nature of the immune response and secondary immunopathological changes that may follow. Clinical syndromes of viral infection are composed largely of cytopathic changes induced by viruses and the immune responses against viral antigenic components and both aspects are fully covered in the various chapters dealing with individual diseases. Each chapter also covers current views on prevention and the role of viral immunization. Each selected topic is presented in considerable detail and in general the information is fully up to date. Where necessary, the experimental background data are included. Viral infections are dealt with in 12 chapters, 8 are devoted to parasitic infections, 2 deal with immunodiagnosis and there is a final chapter on immunoprevention. Each chapter has an extensive bibliography.

The opening chapter deals with poxviruses. For obvious reasons much present knowledge of these is derived from animal models. The possible genetic basis for cellular responses and the phenomenon of "H-2 restriction" in relation to cytotoxic T-cell action are well covered. There is much current interest in herpes and related viruses such as varicella-zoster, Epstein-Barr virus and cytomegalovirus. These may be associated with acute infection with cell death, persistent infection with subsequent reactivation and cell transformation under suitable conditions. The chapter on herpes virus gives a full account of human and experimental infections, the nature of the immune response and the role of the virus in infected cells of the immune system. The existence of similar viruses in life forms that lack complex T and B cells suggests that discoveries of relevant immune mechanisms may lie in a closer study of macrophage-like cells as well as non-specific killer (NK) cells and interferon-like substances.

There is an excellent chapter on hepatitis viruses. Mention is made of views on immunogenetic mechanisms as they may operate in hepatitis B infections and the role that HLA phenotypes may play in determining persistent antigen carriage. However, the problem of whether family clustering of infections is not simply associated with greater opportunity for spread remains unclear.

The dominant role of secretory IgA antibody in response to respiratory tract

infection has been widely investigated. Much of this response appears to be non-specific for the current virus and may reflect antibody specific for previously encountered pathogens. Topics covered include the immune response to influenza viruses, arboviruses, rhinoviruses and respiratory syncytial virus (RSV). There is an interesting account of the use of vaccines applied locally to respiratory tract mucosae as an immunizing tool. Suitable vaccines to RSV still await development following the observation that severe disease may be caused on exposure of those already vaccinated with previous batches of vaccine. Isoprinosine is discussed as an agent with immunopotentiating effects which may be of value in the prevention of respiratory viral infections.

In spite of the book's title one of the longest chapter deals with the immunology of oncornaviruses. Several animal models are considered in detail and there is an account of the possible involvement of occult oncornaviruses in human disease, the search for virus-associated antigens in human tissues and the immune responses to such antigens. The association of virus with human tumours is discussed again in the excellent chapter on Epstein-Barr virus and its role in Burkitt's lymphoma and nasopharyngeal carcinoma, and also in the chapter on human papovaviruses. Other topics include sections on measles, mumps and rubella viruses and one on enteroviruses. There is also a good account of rabies virus, arboviral encephalitis and Guillain-Barré syndrome.

The chapters on parasitic infections are in many ways the most interesting in the book. They are preceded by a general account of possible mechanisms of parasite survival *in vivo*. These include antigen sharing with the host, antigenic variation such as occurs in certain *Plasmodium,* trypanosomes and *Babesia,* rapid membrane turnover as seen in schistosomes and the presence of circulating soluble antigens that bind to antibody. An additional mechanism is production of enhancing antibody that may interfere with cell immune mechanisms, *e.g.* in *P. berghei* infection. This phenomenon is clearly of importance in determining the possible efficacy of certain vaccination procedures. The various topics dealt with include immune mechanisms in toxoplasmosis, *Pneumocystis carinii* infections, malaria, amoebiasis, giardiasis, trichomoniasis, trypanosomiasis, schistosomiasis and helminth infections. Immunology of the last of these is particularly interesting, albeit confusing, since different stages of the parasite's life cycle may coexist in the same infected host.

The two diagnostic chapters deal with mechanisms for detection of antibody and antigens respectively. Different methods are compared and sensitivity and specificity considered. Lack of sensitivity is a problem in that not all infections are detected and lack of specificity can lead to problems with cross-reacting antibodies.

The final chapter on immunoprevention covers general principles of vaccine usage, the role of host immunity and current strategies for control of different diseases and is complementary to the information covered in more detail in individual sections. The use of cross-reacting antigens as immunizing agents and the role of passive immunization are also dealt with. The role of immunization in maintaining suitable levels of herd immunity is vital but the very success of some vaccination procedures in reducing the incidence of infection in communities has led to a drop in immunization rates that may pose problems for the future. New immunization procedures will be determined by advances in genetic analysis of microorganisms and the effect this will have on selection of suitable subcomponent vaccines. Mention is made of the use of recombinant DNA technology to produce viral antigens in bacteria.

As in its companion volume 8, each contribution to this volume is by a recognized authority on the subject and the text constitutes a useful and much needed attempt to bridge the gap between the infectious-disease clinician who may have little background in immunology and the immunologist who is interested in human infectious disease. Both volumes have succeeded in this and, taken

together, form perhaps the most useful amalgam of these two disciplines currently available. Both are to be highly recommended and are as up to date as such ambitious publications can be. *K. C. Watson*

2361 Ellenbogen, C. (1982) **Infectious diseases of war.** *Military Medicine* **147**(3), 185–188

2362 Baeva, E. A., Selezneva, T. S., Glinskaya, E. V. *et al.* (1982) **[Influence of the duration of intervals between injections of adsorbed DPT vaccine on serological characteristics in children]** *Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii* (2), 90–96 [In Russian]

"The influence of the interval between injections of adsorbed DPT vaccine on the effectiveness of immunization has been studied. The intensity of antibody formation to the pertussis component has been found to decrease 2·7–3·7 times if the interval between the injections constituting the course of primary immunization is prolonged for more than 6 months. The interval between the course of primary immunization and the first booster injection, which lasts 1·5–2 years in accordance with the currently accepted immunization schedule, is unreasonably long. Immunological characteristics in respect to pertussis have been found to decrease 8–45 times as early as 16 months after the first booster injection. Most of the vaccinees catching pertussis at that time had the moderately severe form of this infection."

2363 World Health Organization (1982) **Lists of international biological standards, international biological reference preparations, and international biological reference reagents 1982.** 87 pp. Geneva, Switzerland [ISBN 92 4 154161 X] [Sw.fr. 11.-]

HOSPITAL AND OTHER CROSS-INFECTIONS

2364 Hall, C. B. (1981) **Nosocomial viral respiratory infections: perennial weeds on pediatric wards.** *American Journal of Medicine* **70**(3), 670–676

See also abstrs 2425–28.

2365 Sugarman, B. & Musher, D. (1981) **Adherence of bacteria to suture materials.** *Proceedings of the Society for Experimental Biology and Medicine* **167**(2), 156–160

"Sutures were incubated in suspensions of radiolabeled Enterobacteriaceae or *Staphylococcus aureus* and nonadherent bacteria were removed by washing. Adherence of bacteria to gut was up to 100 times greater than to nylon; adherence to polyglycolic acid or silk was intermediate. These results correlate with laboratory and clinical investigations which have suggested that gut sutures have the highest frequency of association with surgical wound infection, followed by silk and nylon in descending order of frequency. Braided materials had increased adherence compared to nonbraided materials, probably due to increased surface area. Adherence of Enterobacteriaceae to suture material was saturable and time dependent and was blocked by addition of unlabeled bacteria. Adherence of bacteria to sutures may be an integral part of the pathogenesis of certain surgical infections."

VENEREAL DISEASES

2366 Luger, A. (1981) **Diagnosis of syphilis.** *Bulletin of the World Health Organization* **59**(5), 647–654

2367 Willcox, R. R. (1981) **Treatment of syphilis.** *Ibid.*, 655–663

2368 Hambie, E. A., Larsen, S. A., Perryman, M. W., Pettit, D. E. & Feeley, J. C. (1982) **Heated versus unheated sera in the hemagglutination treponemal test for syphilis.** *Journal of Clinical Microbiology* **15**(2), 337–338

920 sera were tested, with and without inactivation at 56 °C for 30 min, in the haemagglutination treponemal test for syphilis with a single batch of reagents. There was 99·2% agreement: 324 sera were reactive and 589 non-reactive with both specimens. 4 non-syphilitic sera were reactive only when unheated, 1 syphilitic and 2 non-syphilitic sera were reactive only when heated and these 7 discrepant results showed the same patterns when the tests were repeated. The authors suggest that either heated or unheated sera can be used in this test but they prefer to test inactivated sera because the pattern of agglutination was found to be clearer with heated than with unheated sera. *A. E. Wilkinson*

2369 Pettit, D. E., Larsen, S. A., Pope, V., Perryman, M. W. & Adams, M. R. (1982) **Unheated serum reagin test as a quantitative test for syphilis.** *Journal of Clinical Microbiology* **15**(2), 238–242

2370 Pope, V., Hunter, E. F. & Feeley, J. C. (1982) **Evaluation of the microenzyme-linked immunosorbent assay with *Treponema pallidum* antigen.** *Journal of Clinical Microbiology* **15**(4), 630–634

2371 Brodeur, B. R., Ashton, F. E. & Diena, B. B. (1982) **Enzyme-linked immunosorbent assay with polyvalent gonococcal antigen.** *Journal of Medical Microbiology* **15**(1), 1–9

Indirect enzyme-linked immunosorbent assays (ELISA) were performed, in Ottawa, on 3 groups of sera: from (1) 312 patients attending a family planning clinic who had no previous history of gonorrhoea and had negative cultures for gonococci; (2) 26 laboratory and hospital staff with no history of gonorrhoea; (3) 169 selected high-risk patients attending a venereal diseases clinic (gonococci were grown from 150 of these and the other 19 had a history of gonorrhoea but their cultures were negative). The antigen used in the ELISA was a mixture of outer membrane proteins from 8 serotypes of gonococci prevalent in Canada. Optimal concentrations of antigen, serum and conjugate were determined by titration and the lowest extinction value which distinguished between culture-positive and culture-negative patients was taken as a reading of 0·14 absorbance at 400 nm. On this criterion 6% of the patients in group 1 and 7% in group 2 were seropositive. In the third group of high-risk patients positive ELISAs were obtained in 78% of 101 patients with positive cultures but no previous history of gonorrhoea, in 97% of 49 patients with positive cultures who had had gonorrhoea in the past and in all of 19 patients with a previous history of gonorrhoea but whose cultures were negative. 24 patients in group 3 had asymptomatic infections with positive cultures and all but 4 were seropositive.

It is thought that the ELISA with a polyvalent antigen may be of use as a screening procedure in low-risk populations with a prevalence of gonorrhoea of 1–5%. Positivity due to a previous infection severely limits its value in populations in which the risk of gonorrhoea is high. *A. E. Wilkinson*

2372 Arko, R. J., Finley-Price, K. G., Wong, K.-H., Johnson, S. R. & Reising, G. (1982) **Identification of problem** *Neisseria gonorrhoeae* **cultures by standard and experimental tests.** *Journal of Clinical Microbiology* **15**(3), 435–438

182 strains of suspected gonococci referred to the Centers for Disease Control, Atlanta, U.S.A. were studied. The identification tests used were the cysteine-trypticase agar (CTA) and rapid microcarbohydrate utilization (MCT) tests, the Phadebact co-agglutination (COA), immunofiuorescence (IF) and R-lipopolysaccharide agglutination (LPS) tests. A "correct" identification was based on the results of the CTA and MCT tests, provided these were confirmed by at least 2 of the immunological tests. On this basis the proportions of correct identifications of gonococci were: CTA, 79·2%; MCT, 97·6%; IF, 94·1%; COA 49·3% and 94·3% with 2 sets of reagents; and LPS 67·6%.

141 of the strains were identified as *Neisseria gonorrhoeae,* 20 as *Branhamella catarrhalis, N. sicca* or *N. lactamica* and 9 of these 20 strains grew adequately on modified Thayer-Martin medium. The remaining 21 strains were *N. meningitidis.* Most of these other organisms were isolated from extragenital sites.

These results were obtained on a highly selected group of strains which had posed problems in the laboratories in which they were isolated and not all the tests were performed on all the strains. The MCT had the highest sensitivity (97·8%) and specificity (99·3%) of the tests used. *A. E. Wilkinson*

2373 Rahman, M. (1982) **Penicillin sensitivities of gonococci in 1977–80 from a peripheral health district, and their clinical correlation.** *Postgraduate Medical Journal* **58**(Feb.), 77–79

"Penicillin sensitivities of gonococci isolated from a peripheral health district [in England] were observed during 1977–80 by determining the minimum inhibitory concentrations (MIC) of penicillin. During the same period, outcome of penicillin treatment in patients with gonorrhoea was also observed and recorded. Penicillin resistance, as defined, was found in 19·3% strains in these years, but there were year-to-year variations. None of the strains was a penicillinase producer. Association of higher MICs of penicillin with therapeutic failures was not observed in this study until the MICs were greater than 1·0 mg/l. The findings are discussed together with reviews from other published works."

2374 Weekly Epidemiological Record (1982) **57**(17), 133–134. **Surveillance of β-lactamase-producing** *Neisseria gonorrhoeae* **(PPNG): resistance to spectinomycin** [In English and French]

The number of penicillinase-producing *Neisseria gonorrhoeae* (PPNG) isolated in the U.K. more than doubled in 1981 to 444 (211 in 1980). These strains now cause about 1% of all cases of gonorrhoea. An increasing number of the infections was acquired in Britain. Plasmid analysis of PPNG was added to surveillance methods in June 1981 and, between December 1981 and February 1982, 8 strains carrying a combination of the $3{\cdot}2 \times 10^6$ molecular weight "Africa" plasmid and the 24×10^6 transfer plasmid were isolated.

An editorial note comments that "Genetic changes of the gonococcus may well be the cause of yet unconfirmed observations from some East Asian countries of recent dramatic increases of penicillinase-producing gonococcal strains where they may give rise to up to 70% of all gonococcal infections."

The report also records a case of gonorrhoea in a tourist from the Philippines in Malaysia. The infecting β-lactamase-producing strain was resistant to spectinomycin. *D. W. FitzSimons*

2375 Ansink-Schipper, M. C., Van Embden, J. D. A., Van Klingeren, B. & Woudstra, R. (1982) **Further spread of plasmids among different auxotypes of pencillinase-producing gonococci.** [Correspondence] *Lancet* **i**(Feb. 20), 445

314 strains of penicillinase-producing *Neisseria gonorrhoeae* (PPNG) isolated in Amsterdam from February to October 1981 were auxotyped. 210 strains carried plasmids of molecular weights 3·2 and 24 × 10^6; of these, 207 were wild types with no special nutritional requirements but 3 needed arginine or ornithine for growth. 36 strains carried only a 3·2 × 10^6 plasmid; 33 of these were wild types and 3 required proline and arginine. 40 strains had 4·5 and 24 × 10^6 plasmids; 7 of these were wild types, 17 needed proline and 16 were of other auxotypes. 28 strains carried the 4·5 × 10^6 R plasmid but not the larger transfer plasmid; all required proline. Almost all the strains with the 3·2 × 10^6 R plasmid but none with the 4·5 × 10^6 R plasmid were inhibited by phenylalanine; this test may be useful in distinguishing between the African and Asian strains of PPNG. The results also suggest that R and transfer plasmids are spreading into new auxotypes of gonococci in Holland. *A. E. Wilkinson*

2376 Sandven, P., Solberg, O., Ødegaard, K. & Myhre, G. (1982) **Improved medium for the transportation of gonococcal specimens.** *Acta Pathologica, Microbiologica et Immunologica Scandinavica* **90B**(1), 73–77

The survival of gonococci was determined in various transport media: Stuart's, Amies', SBL (essentially Stuart's medium with cysteine) and SIFF (with less agar and glycerophosphate than Stuart's but with starch and about 3 g/l each of NaCl and KCl). Numbers of cells of isolated strains declined over 72 h, roughly 10^4-fold in Stuart's medium and 100-fold in SIFF. Three of 6 strains did not survive so well without the additional chlorides in SIFF; all benefited from the starch. Gonococci were isolated from roughly the same number of clinical specimens after 24 h storage in Stuart's, SBL and SIFF media but after 72 h they were isolated from only 10 stored in Stuart's medium in comparison with 46 in SIFF.

[Without the questionable reduction of the probabilities by one-half, which the authors do not justify, the figures in rows 1 of Table 2 and 2 of Table 3 would not depart significantly from the null hypothesis. The numbers of observed survivors shown in Table 1 depart significantly from those expected through the marginal totals, the few in Stuart's medium at 72 h and the large number in this at 24 h and in SIFF at 72 h making the significant contributions to χ^2.] *P. B. Crone*

2377 Greenwood, J. R. & Kirk-Hillaire, K. (1981) **Evaluation of acridine orange stain for detection of** *Trichomonas vaginalis* **in vaginal specimens.** *Journal of Clinical Microbiology* **14**(6), 699

It has been claimed that acridine orange staining of vaginal exudates is a significantly more sensitive method than wet-mount examinations for the detection of *Trichomonas vaginalis*. To assess this claim the present authors undertook a small-scale comparative study of the two methods. 105 vaginal specimens were

examined. *T. vaginalis* was found in 15 samples by wet mount examination and all of these together with one additional sample were positive on staining with acridine orange. Thus there was close correlation by the two methods with 94% agreement in positive specimens and 99% agreement in negative samples. Both methods gave comparable results but wet-amount examination of freshly collected specimens had the advantage of speed and did not require fluorescence microscopy.

C. A. Morris

2378 i. Hjelm, E., Hallén, A., Forsum, U. & Wallin, J. (1981) **Anaerobic curved rods in vaginitis.** [Correspondence] *Lancet* **ii**(Dec. 12), 1353–1354

ii. Sprott, M. S., Pattman, R. S., Ingham, H. R., Short, G. R., Narang, H. K. & Selkon, J. B. (1982) **Anaerobic curved rods in vaginitis.** [Correspondence] *Ibid.,* **i**(Jan. 2), 54

iii. Phillips, I. & Taylor, E. (1982) **Anaerobic curved rods in vaginitis.** [Correspondence] *Ibid.,* **i**(Jan. 23), 221

Correspondence from Sweden is responded to by two accounts from Britain; all describe the isolation of obligate-anaerobic curved bacilli from vaginal secretions of patients with vaginitis.

i. Highly motile rod-shaped organisms were observed in wet smears of vaginal secretions from 48 of 162 (30%) women with non-specific vaginitis who had attended a Swedish clinic for sexually transmitted diseases. Pure cultures of a nutritionally exacting, anaerobic, motile Gram-negative bacillus were obtained from 10 out of 17 of these women and detailed characteristics of these strains are described including observations of their very limited biochemical reactivity and characteristics by electron microscopy (which includes the observations of a single subpolar flagellum) and by gas chromatography. The authors suggest that this organism is related to but different from that described by A. H. Curtis in 1913 (*Journal of Infectious Diseases* 1913, **12,** 165), and suggest that its role as a cause of vaginitis deserves study.

In the letter from Newcastle-upon-Tyne, England (ii), the authors record the finding also of anaerobic motile curved Gram-negative rods in secretions of women with vaginal discharge. Their observations differ from those of the Swedish workers in two respects. The bacilli tend to stain poorly and dilute carbol fuchsin is recommended as counterstain whereupon 48 h cultures may appear Gram positive. Electron microscopy showed curved rods 0·3 by 2·3 μm with rounded ends and 2–6 subpolar flagellae; this description resembles more closely the organism described by Curtis using light microscopy. These vibrios appear to be resistant to metronidazole, a property that is not typical of most obligate anaerobes.

A letter from the Department of Microbiology of St Thomas's hospital, London (iii), draws attention to other descriptions of anaerobic vaginal vibrios [see, *e.g.*, *Bulletin of Hygiene* 1954, **29,** 1263]. The authors have also observed anaerobic vaginal vibrios but these appear to be less nutritionally exacting than those described from Sweden (their organisms grew readily on Columbia blood agar after 48 h) and have characteristics closely resembling the description of Curtis and, more recently, workers in France. They suggest that separate bacterial populations may have been studied by the Swedish and Newcastle workers. Experience in London indicates that anaerobic bacteria and *Gardnerella vaginalis* are also present in association with the vibrios; this is consistent with the suggestion that a mixture of anaerobes may act together to cause non-specific urethritis.

The relationship of these obligate anaerobic vibrios to vaginitis clearly justifies substantially more attention and study than heretofore. *C. A. Morris*

2379 Salit, I. E. & Frasch, C. E. (1982) **Seroepidemiologic aspects of *Neisseria meningitidis* in homosexual men.** *Canadian Medical Association Journal* **126**(1), 38–41

Among 383 homosexual men attending either a venereal disease clinic or a community screening clinic meningococci were cultured in 35%. Of the positive specimens 93·5% were from the throat, 5·8% from the rectum and 0·72% from the urethra. The serogroups and serotypes of the isolates were similar to those commonly found in other asymptomatic carriers.

Gonococci were isolated from 8·6% (14·7% of positive isolates being from the throat and 85·3% from the rectum) and were 1·4 times more common in those who also harboured meningococci. In only 2 instances were both organisms isolated from the same site. In 13 of the 14 cases of concomitant isolation the gonococci were isolated from the rectum and the meningococci from the throat.

Therapy is not generally recommended for asymptomatic homosexual men who harbour meningococci in the throat, rectum or urethra. *R. R. Willcox*

2380 Gottlieb, M. S., Schroff, R., Schanker, H. M. *et al.* (1981) ***Pneumocystis carinii* pneumonia and mucosal candidiasis in previously healthy homosexual men.** *New England Journal of Medicine* **305**(24), 1425–1431

In this series 4 homosexual men who acquired *Pneumocystis carinii* pneumonia, mucosal candidiasis and multiple viral infections had in common the presence of cytomegalovirus (CMV). As in other reported series, there was cellular immunodepression with intense lymphopenia and anergy. It is thought that the frequent opportunity for homosexual men to come in contact with secretions containing CMV may account for the immune deficiency. In the present patients there has been no recovery of cellular immunocompetence in spite of intensive supporting measures.

[See also *Abstr. Hyg.* 1982, **57**, abstrs 120–122 and abstrs 2381 and 2382 below.] *G. W. Csonka*

2381 Masur, H., Michelis, M. A., Greene, J. B. *et al.* (1981) **An outbreak of community-acquired *Pneumocystis carinii* pneumonia. Initial manifestation of cellular immune dysfunction.** *New England Journal of Medicine* **305**(24), 1431–1438

11 cases of community-acquired *Pneumocystis carinii* pneumonia are reported. They occurred in young men who were drug abusers or homosexuals or both. Cell-mediated immune defects were found in all patients. Eight died. It was noted that 4 patients had long standing anorexia, fever and loss of weight long before the episode of pneumonia, a feature also reported in other series. Among other infectious agents isolated were cytomegalovirus, *Candida, Cryptococcus, Aspergillus,* mycobacteria and *Klebsiella.* It is concluded that this outbreak of *P. carinii* pneumonia was probably related to the immunological status of the patients rather than due to a new virulent or treatment-resistant strain of the organism.

G. W. Csonka

2382 Durack, D. T. (1981) **Opportunistic infections and Kaposi's sarcoma in homosexual men.** *New England Journal of Medicine* **305**(24), 1465–1467

The history of much that is known about the opportunistic infections and Kaposi's sarcoma in homosexual men which was recently reported is reviewed. The list of organisms implicated is increasing and includes Gram-negative bacteria,

viruses, fungi and protozoa. There is laboratory evidence of cellular immune defect while humoral immune responses are normal. Although cytomegalovirus (CMV) has been associated in most cases it cannot be invoked to explain why this syndrome is apparently new. The possibility exists that drug abuse, especially inhalation of nitrites, is a factor as might the increased promiscuity found in this group of men. It has been suggested that the combination of drug-taking with persistence of certain viral infections causes immunosuppression in genetically predisposed men and that CMV induces Kaposi's sarcoma in this situation. Studies of this new syndrome may lead to a greater understanding of host–parasite relations, as indicated in this useful review. *G. W. Csonka*

2383 Doll, D. C. & List, A. F. (1982) **Burkitt's lymphoma in a homosexual.** [Correspondence] *Lancet* **i**(May 1), 1026–1027

The authors describe a case in which American Burkitt's lymphoma developed in a homosexual man with *Giardia lamblia* colitis and rectal gonorrhoea. (This lymphoma, like Kaposi's sarcoma, is uncommon in the U.S.A.)

The patient frequently used drugs, including amyl nitrite. After treatment he is alive and well after 2 years' follow-up. *D. W. FitzSimons*

2384 Morbidity and Mortality Weekly Report (1982) **31**(11), 137–139. **Genital herpes infection—United States, 1966–1979**

This note from the Centers for Disease Control, Atlanta, comments on an analysis of data on genital herpes collected by the National Disease and Therapeutic Index from U.S. private physicians between 1966 and 1979. The annual number of consultations for genital herpes during this period rose from 29 560 to 260 890. There was a corresponding 9-fold increase in the rate of consultations, rising from 3·4 per 100 000 consultations to 29·2 per 100 000. In contrast, there was a less than 2-fold rise in the consultation rate for oral herpes. These data are in general agreement with observations from other sources and it is concluded that social, demographic and behavioural changes have led to an increased proportion of the U.S. population being at risk from sexually transmitted diseases such as genital herpes. *E. A. Boulter*

2385 Siegal, F. P., Lopez, C., Hammer, G. S. *et al.* (1981) **Severe acquired immunodeficiency in male homosexuals, manifested by chronic perianal ulcerative herpes simplex lesions.** *New England Journal of Medicine* **305**(24), 1439–1444

Four homosexual men developed gradually enlarging perianal ulcers due to herpes simplex. In addition *Pneumocystis carinii,* cytomegalovirus and *Candida albicans* were isolated. Three patients died and the fourth developed Kaposi's sarcoma. As in all other similar reports, there was depression of cell-mediated immunity. The earlier medical history of these patients was negative for recurrent infections or neoplastic disease and suggests that the underlying immune defect was recently acquired. The growing number of these strikingly similar reports in the U.S.A. suggests a nation-wide epidemic of immunodeficiency among homosexual men. The most constant laboratory finding was profound lymphopenia, which might explain many of the other abnormal immunological measurements. *G. W. Csonka*

See also abstr. 2519.

2386 Tompkins, D. S., Waugh, M. A. & Cooke, E. M. (1981) **Isolation of intestinal spirochaetes from homosexuals.** *Journal of Clinical Pathology* **34**(12), 1385–1387

Spirochaetes were isolated and cultured from the rectum of 2 homosexual men and the faeces of a third man. These organisms were not found in 22 other homosexual men. The case reports of the patients with positive isolation are given but no specific symptoms associated with the spirochaetes were detected. The organism resembles morphologically *Treponema vincentii* but the structure of the spirochaetes is variable. The significance of these organisms is unknown.

G. W. Csonka

See also abstr. 2576.

MICROBIOLOGY—GENERAL

2387 Bulletin of the World Health Organization (1981) **59**(5), 717–728. **Use and abuse of eight widely-used diagnostic procedures in clinical immunology: a WHO Memorandum**

This is a timely reminder that there are many pitfalls and limitations to even the widely used immunodiagnostic tests. The subjects dealt with are immunoglobulin measurement and analysis; measurement of total and specific IgE; the detection of immune complexes; detection of auto-antibodies; determination of B and T cells; and lymphocyte responses to mitogens. The clinical indications for each test are indicated together with the pitfalls associated with each procedure. Technical details of methods are not given.

A. Voller

2388 Snell, J. J. S., De Mello, J. V. & Gardner, P. S. (1982) **The United Kingdom national microbiological quality assessment scheme.** *Journal of Clinical Pathology* **35**(1), 82–93

BACTERIOLOGY

2389 Sanders, C. C., Moellering, R. C. Jr, Martin, R. R. *et al.* (1982) **Resistance to cefamandole: a collaborative study of emerging clinical problems.** *Journal of Infectious Diseases* **145**(1), 118–125

Prompted by reports of discrepancies between *in vitro* activity and *in vivo* efficacy of cephamandole, the authors examined in some detail infections due to cephamandole-resistant bacteria in 5 patients. Each of the patients had a serious infection [see original article for details] and in 4 of the 5 cases *Enterobacter* spp. were involved. The fifth infection was due to *Escherichia coli.*

In 3 cases (2 *Enterobacter,* 1 *Esch. coli*) strains initially sensitive to cephamandole developed resistance during therapy. In the fourth case, resistance was present from the outset, but was detected only in broth dilution tests (*i.e.* disc diffusion tests indicated susceptibility). In the fifth case cephamandole-resistant bacteria were isolated during therapy in a patient being treated with the drug because of faecal spillage into the peritoneum at operation.

All 4 *Enterobacter* strains were shown to produce inducible β-lactamases. In the 2 cases in which resistance in *Enterobacter* developed during therapy, the resistance

was shown to be accompanied by the appearance of new β-lactamase bands on isoelectric focusing. The *Esch. coli* strain that developed resistance displayed an enhanced capacity to degrade cephamandole, but no alteration in the isoelectric focusing pattern.

David Greenwood

2390 Degener, J. E., Smit, A. C. W., Michel, M. F., Valkenburg, H. A. & Muller, L. (1982) Gevoeligheid van Gram-negatieve aërobe darm-flora voor tetracycline, ampicilline, sulfamethoxazol en gentamicine in een open bevolking in Nederland. **[Sensitivity of Gram-negative aerobic intestinal flora to tetracycline, ampicillin, sulphamethoxazole and gentamicin in a group of the Dutch population chosen at random]** *Nederlands Tijdschrift voor Geneeskunde* **126**(7), 277–280 English summary

2391 Keaney, M., Caister, H., Bax, R. & Noone, P. (1982) **Clinical experience with cefotaxime in hospitalized patients.** *Journal of Antimicrobial Chemotherapy* **9**(4), 313–317

"Cefotaxime, the first of the third-generation cephalosporin antibiotics, successfully treated a wide range of infections in seriously ill hospital patients (including bacteraemia, pneumonia and severe soft tissue infections), expecially when caused by Gram-positive organisms, *Haemophilus* spp. and coliforms including antibiotic-resistant bacteria, such as methicillin-resistant staphylococci and aminoglycoside-resistant coliforms. There was minimal toxicity, even when combined with an aminoglycoside, and no excessive accumulation of the drug in patients with markedly impaired renal function. Major sepsis caused by *Klebsiella* and *Pseudomonas aeruginosa* did not respond well, although this probably reflected the severe underlying pathology in many of these patients."

2392 Huovinen, P., Mäntyjärvi, R. & Toivanen, P. (1982) **Trimethoprim resistance in hospitals.** *British Medical Journal* **284**(Mar. 13), 782–784

"During November 1980 to April 1981, 1561 urinary tract pathogens were collected from Turku City Hospital, Turku University Central Hospital, and Kuopio University Central Hospital [Finland]. Resistance of the strains was tested by agar-plate dilution against trimethoprim, sulphamethoxazole-trimethoprim, sulphamethoxazole, ampicillin and nitrofurantoin. Resistance to trimethoprim (≥8 mg/l) occurred in 8·6–12·2% of strains from the university hospitals (*Pseudomonas* excluded) and 38·3% of strains from Turku City Hospital. Resistance of *Escherichia coli* occurred in 4·1–6·2% of strains from the university hospitals and 21% of strains from Turku City Hospital. *Proteus mirabilis* was the most resistant of the clinically important bacterial species with resistance to trimethoprim in 29–78%.

"Attention is called for in defining the type of hospital used for a particular study: bacterial resistance in different hospitals cannot be compared direct and one hospital is not necessarily representative for a whole country. After seven years' use of plain trimethoprim the prevalence of resistance in the two university hospitals in Finland was similar to that in a London hospital just before plain trimethoprim was registered for use in Britain."

2393 Wilks, M., Thin, R. N. & Tabaqchali, S. (1982) **Quantitative methods for studies on vaginal flora.** *Journal of Medical Microbiology* **15**(1), 141–147

The authors evaluated 3 previously described methods for quantitative sampling of the bacterial flora of the vagina. As they found none of these methods

satisfactory, they devised a simple weight-based method in which they collected an undefined volume of secretion on a loop for weighing in a tube of transport medium before homogenization and quantitative bacteriological testing; this method appeared to give satisfactory results.

Indirect estimations of the weight of vaginal secretions collected on paired swabs of 3 types proved unsatisfactory, with gross discrepancies between the weight of one-third of the paired specimens. Homogenization of inoculated swabs also gave low recovery rates. Equally unsatisfactory was sampling by volume by means of pipettes because of difficulty in expelling secretions from the pipettes. The authors' method of adding loopfuls of secretions to a weighed tube of transport medium gave the most reliable and reproducible results which were independent of differences in viscosity and density of the secretion.

C. A. Morris

BACTERIAL DISEASES

2394 HARN, H. & KAUPMANN, S. H. E. (1981) **The role of cell-mediated immunity in bacterial infections.** *Reviews of Infectious Diseases* **3**(6), 1221–1250 [350 references]

2395 BROOK, I. (1981) **The importance of lactic acid levels in body fluids in the detection of bacterial infections.** *Reviews of Infectious Diseases* **3**(3), 470–478 [52 references]

". . . Although measurement of lactate levels is not a test without faults, it is still a valuable tool in the early recognition of bacterial infections of various body cavities and can assist in the differentiation between infectious and noninfectious conditions . . ."

2396 ASSCHER, A. W. (1982) **Renal damage due to urinary tract infection.** *Saudi Medical Journal* **3**(2), 74–78 [31 references]

". . . In this review the hypothesis that failure to reduce mortality from chronic pyelonephritis is due to inadequate detection and treatment of covert urinary tract infection is examined . . ."

2397 FILE, T. M. Jr, TAN, J. S., BAIRD, I., SIMON, J. W. & SUMMERS, J. L. (1982) **Evaluation of cefoperazone in the therapy of urinary tract infections.** *Journal of Antimicrobial Chemotherapy* **9**(3), 223–230

In this non-comparative study, the efficacy of parenteral cefoperazone sodium was assessed in 49 patients admitted to hospital with acute bacterial infections. The pathogen was eradicated in 91% of cases. Bacteriological failures occurred in patients who had a past history of more than 2 urinary tract infections or a urinary tract abnormality. Adverse reactions reported by 15 of 92 patients originally receiving cefoperazone included rash, phlebitis, diarrhoea, abnormality of the Coombs' test and serum transaminases. 12% of patients had a reduction of haemoglobin greater than 10% while on cefoperazone.

[See also *Abstr. Hyg.* 1980, **55**, abstr. 759.] *K. Slatford*

2398 Olsvik, Ø., Bergan, T. & Øye, I. (1981) **Shedding of intestinal epithelium induced by chlorpromazine as mechanism inhibiting enterotoxin diarrhoea.** *Current Microbiology* **6**(5), 263–268

". . . Functional mucosa cell interference may . . . be a more general mechanism whereby pharmaceutical agents can reduce intestinal fluid secretion following exposure to bacterial enterotoxin."

2399 Tierno, P. M. Jr (1981) **Cellulase activity of microorganisms on carboxymethylcellulose from tampons.** [Correspondence] *Lancet* **ii**(Oct. 3), 746–747

The author describes a study of the pathogenesis of toxic shock syndrome (TSS). The cellulase activity of 85 strains of bacteria or yeasts which have been described in vaginal flora was investigated. Carboxymethylcellulose chips (R-CMC), which are a constituent of a brand of tampon, were added to a suspension of each organism and the tubes incubated overnight at 35 °C. Cellulase activity (indicated by liquefaction of R-CMC) was shown by many Enterobacteriaceae, notably *Klebsiella, Proteus, Providencia, Enterobacter* and *Serratia* but not by the Gram-positive strains tested or by *Bacteroides* or yeasts. The author suggests that cellobiose, glucose and related compounds formed as hydrolytic products of R-CMC may provide conditions conducive to the elaboration of exotoxins by *Staphylococcus aureus* and the Enterobacteriaceae themselves may be a source of enotoxin contributing to TSS. *C. A. Morris*

2400 Lee, R. V., Dillon, W. P. & Baehler, E. (1982) **Barrier contraceptives and toxic shock syndrome.** [Correspondence] *Lancet* **i**(Jan. 23), 221–222

A case is reported of toxic shock syndrome in a 27-year-old woman 2 months after childbirth. However 3 days after inserting a diaphragm contraceptive she developed a purulent, foul-smelling vaginal discharge which gave a culture of a penicillin-resistant *Staphylococcus aureus*. Urine culture yielded the same organism. The patient exhibited generalized erythema, fever, strawberry tongue and one week later skin desquamation on her soles and palms. She was treated with oxacillin and her recovery was normal. It is suggested that any interference with normal clearance of vaginal secretions, at any phase of the menstrual cycle, can allow multiplication of the toxin-producing staphylococci and cause toxic shock syndrome. *Curtis G. Gemmell*

2401 Carfrae, D. C., Bell, E. J. & Grist, N. R. (1982) **Fatal haemorrhagic pneumonia in an adult due to respiratory syncytial virus and** *Staphylococcus aureus*. *Journal of Infection* **4**(1), 79–80

See also abstr. 2577.

2402 Olsvik, Ø., Berdal, B. P., Fossum, K. & Omland, T. (1981) **Enterotoxin production by** *Staphylococcus aureus* **related to the origin of the strains.** *Acta Pathologica et Microbiologica Scandinavica* **89B**(6), 423–426

Strains of *Staphylococcus aureus* were tested for the production of enterotoxins A, B and C by an enzyme-linked immunosorbent assay. 15 of 35 strains isolated from human clinical specimens, 65 of 111 strains from animal clinical specimens

and all 24 strains from routine foods and foods implicated in outbreaks of food poisoning were enterotoxigenic.

Production of enterotoxin A predominated among strains from dogs and from outbreaks of food poisoning. Strains from cows and from milk often produced enterotoxin C. *Antonnette A. Wieneke*

2403 Berdal, B. P., Olsvik, Ø. & Omland, T. (1981) **A sandwich ELISA method for detection of *Staphylococcus aureus* enterotoxins.** *Acta Pathologica et Microbiologica Scandinavica* **89B**(6), 411–415

The authors developed a four-layer sandwich (goat anti-enterotoxin serum–enterotoxin–rabbit anti-enterotoxin–alkaline phosphatase-labelled goat anti-rabbit IgG) enzyme-linked immunosorbent assay for the detection of staphylococcal enterotoxin A, B and C in broth cultures. The sensitivity of the method was 0·5 ng of enterotoxin/ml. Interfering protein A was removed from culture supernatant fractions with rabbit IgG coupled to Sepharose CL-4B gel.

Antonnette A. Wieneke

2404 Savage, D. & Brown, J. (1981) **Endocarditis due to group A streptococcus.** *American Journal of Medical Sciences* **282**(3), 98–103

This paper reviews 7 cases of group A streptococcal endocarditis which occurred during a 30-month period among a total of 85 cases of infective endocarditis at Harlem Hospital, New York. Six of the 7 patients were heroin users, accounting for 14% of the 43 cases of addiction-associated endocarditis. These 6 patients all showed tricuspid valve infection diagnosed by positive blood cultures, roentgenographic embolic pneumonia and by auscultatory evidence of tricuspid regurgitation. The seventh patient, not a heroin user, had aortic endocarditis proven at autopsy. The unusually high rate of group A streptococcal endocarditis is discussed by the authors. *Diana Martin*

2405 Edwards, E.A., Phillips, I. A. & Suiter, W. C. (1982) **Diagnoses of group A streptococcal infections directly from throat secretions.** *Journal of Clinical Microbiology* **15**(3), 481–483

A latex agglutination test was used to identify soluble group A antigen directly from throat secretions. Standard culture was also performed as a control test. Results from the paired methods of laboratory diagnosis did not correspond in every case. The discrepancies could not be explained, and further study of these is indicated. *P. W. Ross*

2406 Beachey, E. H. & Simpson, W. A. (1982) **The adherence of group A streptococci to oropharyngeal cells: the lipoteichoic acid adhesin and fibronectin receptor.** *Infection* **10**(2), 107–111

2407 Haug, R. H., Gudding, R. & Bakken, G. (1981) **Serotyping and bacteriophage typing of human and bovine group-B streptococci.** *Journal of Medical Microbiology* **14**(4), 479–482

The authors' main objective was to compare serotyping and phage typing of strains of group B streptococci from human and bovine origin. Serotyping and phage typing were done by conventional techniques. A standard set of antisera prepared against the international set of reference type strains was used. The phage set comprised 24 phages of human origin.

In all, 89 strains of human origins and 125 bovine isolates were examined. In both sets isolates had been obtained from normal and infected sites. Regardless of origin various serotypes and patterns were recognized among isolates. Bovine and human isolates were lysed by phages at the same frequency. The major importance of this study is the demonstration that phage typing may provide useful and additional information to serotyping in epidemiological studies of group B streptococci isolated from both human and bovine sources. *Diana Martin*

2408 Kim, K. S. & Anthony, B. F. (1981) **Penicillin tolerance in group B streptococci isolated from infected neonates.** *Journal of Infectious Diseases* **144**(5), 411–419

Of group B streptococci isolated from the blood or cerebrospinal fluid of infected neonates 4% were shown to be tolerant to penicillin by slower killing rates at penicillin levels 16 times greater than the minimal inhibitory concentrations. This phenomenon was observed only in the logarithmic phase of growth.

The clinical importance of penicillin tolerance in group B streptococci is unknown but it would clearly be advisable to know this, particularly in serious illness, and it is encouraging that a simple and reliable procedure has recently been developed to detect tolerance. *P. W. Ross*

2409 Fischer, P. R., Stanberry, L. R. & Glasgow, L. A. (1982) **Gas formation in the pleural space of a child with an anaerobic streptococcal pneumonia and empyema.** *Pediatrics* **69**(4), 492–494

A report of a case.

2410 Wicher, K., Kalinka, C., Mlodozeniec, P. & Rose, N. R. (1982) **Fluorescent antibody technic used for identification and typing of** *Streptococcus pneumoniae. American Journal of Clinical Pathology* **77**(1), 72–77

2411 Heidelberger, M., Dutton, G. G. S., Eriksen, J., Nimmich, W. & Stirm, S. (1982) **Additional correlations of chemical structure and immunological specificity among cross-reactions of pneumococci and** *Klebsiella. Acta Pathologica, Microbiologica et Immunologica Scandinavica* **90C**(2), 87–90

See also *Abstr. Hyg.*, 1979, **54,** abstr. (1846).

2412 Kuzemenská, P. & Walter, G. (1982) Výsledky celostátní studie "zjištění cirkulace N. meningitidis ve zdravé populaci ČSR" probihající 26.5. – 7.6.1980 ve všech krajich ČSR. **[Results of an all-state study on the determination of circulation of** *Neisseria meningitidis* **in the healthy population of the Czechoslovak People's Republic, 26 May to 7 June 1980]** *Československá Epidemiologie, Mikrobiologie, Imunologie* **31**(1), 30–37 English summary

Serological examination of 2932 healthy people under the age of 25 years in Czechoslovakia indicated a carrier rate for *Neisseria meningitidis* of 10·2%. Serogroup B was the most common, 3 times more so than group C. *D. W. FitzSimons*

See also abstr. 2379.

2413 Belova, T. N. (1982) **[Bactericidal antibodies to meningococci, serogroups A, B and C, in subjects immunized with polycomponent meningococcal vaccine]** *Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii* (1), 95–97 [In Russian]

"Three groups consisting of 56, 55 and 57 subjects were immunized with polycomponent meningococcal vaccine incorporating microbial cell-wall substance in the polymetric form. The vaccine was introduced in doses of 0·25 ml, 0·5 ml and 1·0 ml respectively, which corresponded to 100 μg, 200 μg and 400 μg of the dry substance of the vaccine. Each of 53 subjects in the control group received placebo (physiological saline) in a dose of 0·5 ml. Serum specimens were taken from all vaccinees prior to injection and on days 21–24. After the injection of the vaccine in a dose of 0·25 ml the arithmetical mean of the antimeningococcal titers increased approximately 70-fold to serogroup A, 20-fold to serogroup B and 120-fold to serogroup C, and after the injection of the vaccine in doses of 0·5 ml and 1·0 ml the titers increased 225-fold, 80-fold and 480-fold, respectively. The fact of the formation of bactericidal antibodies to serogroup B meningococci is particularly noteworthy."

2414 Blackwell, C. C. & Law, J. A. (1981) **Typing of non-serogroupable *Neisseria meningitidis* by means of sensitivity to R-type pyocines of *Pseudomonas aeruginosa*.** *Journal of Infection* **3**(4), 370–378

The conventional method of serotyping *Neisseria meningitidis* uses the agglutination test to distinguish between capsular polysaccharide antigens. Recovery of non-serogroupable isolates of meningococci from the genitourinary tract and rectum of patients stimulated the study reported in this paper. The demonstrated sensitivity of many such strains to partially purified rod-type (R-type) pyocines produced by *Pseudomonas aeruginosa* led to an investigation of pyocine sensitivity typing as an epidemiological tool. 66% of 50 (33) non-serogroupable strains were shown to be sensitive to a range of the 13 pyocines applied, but only 11% (7 of 63) of serogroupable isolates were sensitive. Patterns obtained were reproducible and sensitivity was a stable characteristic. The authors propose this method as an epidemiological tool when conventional agglutination fails. *Diana Martin*

2415 Rahal, J. J. & Simberkoff, M. S. (1982) **Host defense and antimicrobial therapy in adult Gram-negative bacillary meningitis.** *Annals of Internal Medicine* **96**(4), 468–474 [64 references]

2416 Swedish Study Group (1982) **Cefuroxime versus ampicillin and chloramphenicol for the treatment of bacterial meningitis.** *Lancet* **i**(Feb. 6), 295–299

"In a prospective randomised multicentre study cefuroxime was compared with a combination of ampicillin and chloramphenicol in the treatment of 50 consecutive patients with acute bacterial meningitis, in 40 of whom the bacterial aetiology was proven by cerebrospinal-fluid (CSF) cultures. Excellent clinical results were obtained in 18 of 21 evaluable patients treated with cefuroxime and in 14 of 19 evaluable patients treated with ampicillin and chloramphenicol. The meningitis was caused by *Haemophilus influenzae* in 20 of the evaluable patients, by meningococci in 11, by pneumococci in 5, and by other bacterial species in 4. . . . Cefuroxime is an alternative for treatment of acute bacterial meningitis in children and adults."

2417 THADEPALLI, H., GANGOPADHYAY, P. K., ANSARI, A., OVERTURF, G. D., DHAWAN, V. K. & MANDAL, A. K. (1982) **Rapid differentiation of bacterial meningitides by direct gas-liquid chromatography.** *Journal of Clinical Investigation* **69**(4), 979–984

Gas-liquid chromatography of bacterial broth cultures and of cerebrospinal fluid from experimentally infected animals and from patients with meningitis demonstrated the presence of succinic acid as a metabolic product of *Haemophilus influenzae* and of various other bacilli, but not of cocci such as pneumococci and meningococci. A gas-liquid chromatography result can be available within an hour of collection of a cerebrospinal fluid specimen, and could provide useful diagnostic information.

[See also LAFORCE *et al.*, *Abstr. Hyg.* 1980, **55,** abstr. 2978.] *D. C. Turk*

2418 CORKILL, J. E. & MAKIN, T. (1982) **A selective medium for non-pathogenic aerobic Gram negative cocci from the respiratory tract: with particular reference to** *Branhamella catarrhalis*. *Medical Laboratory Sciences* **39**(1), 3–10

Modified Thayer-Martin medium (TM) grew a type strain of meningococci well and in undiminished numbers but not 5 type strains of upper respiratory Gram-negative cocci (GNC). All of the latter were inhibited by $\leqslant 0{\cdot}5$ mg/l colistin. Nine of 15 isolates of GNC that produced β-lactamase (all with MICs $\geqslant 2$ mg/l) grew well but only 2 of 5 that did not. The authors assert [no results given] that TM without colistin had no adverse effect on the GNC tested.

[As often, revelations incidental to the purpose impress most: (1) dissociation between type strains and isolates (all 5 of the former and 3 out of 20 of the latter showed no growth on TM); (2) poor correlation between MIC and disc test (all of 5 type strains were inhibited by an MIC > 10 mg/l vancomycin; 1 of 5 strains was resistant).] *P. B. Crone*

2419 MAZLOUM, H. A., KILIAN, M., MOHAMED, Z. M. & SAID, M. D. (1982) **Differentiation of** *Haemophilus aegyptius* **and** *Haemophilus influenzae*. *Acta Pathologica, Microbiologica et Immunologica Scandinavica* **90B**(2), 109–112

The Koch-Weeks conjunctivitis bacillus (later *Haemophilus aegyptius*) was first observed in 1883, and Pfeiffer described his influenza bacillus (later *H. influenzae*) in 1892. The long controversy about their relationship seemed to have been resolved in 1974 by Kilian's inclusion of *H. aegyptius* in his biotype III of *H. influenzae*; but with colleagues from Egypt Kilian has now presented convincing arguments for reinstating *H. aegyptius* as a separate species. *D. C. Turk*

2420 i. MUSHER, D. M. & WALLACE, R. J. Jr (1982) **Nontypeable** *Haemophilus influenzae:* **definitely pathogenic for adults.** *Archives of Internal Medicine* **142**(3), 448–449

2421 ii. BERK, S. L., HOLTSCLAW, S. A., WIENER, S. L. & SMITH, J. K. (1982) **Nontypeable** *Haemophilus influenzae* **in the elderly.** *Ibid.*, 537–539

In an editorial review, Musher and Wallace (i) recapitulate their own and other workers' evidence that non-typable (which should be synonymous with non-capsulated) *Haemophilus influenzae* strains are important pathogens in adults, particularly as causes of pneumonia. They attach considerable importance to the accompanying paper by Berk *et al.* (ii) which is an account of 12 elderly men with

pneumonia, all of whom had non-typable *H. influenzae* strains recovered from transtracheal aspirates in pure culture, but had negative blood cultures.

[In Britain, where virtually pure growths of non-typable *H. influenzae* strains from bronchial material are common, the aetiology of the pneumonia in these 12 cases might still be considered questionable; but we certainly need clearer evidence as to how often non-capsulated *H. influenzae* strains, so commonly pyogenic in damaged bronchi, can also cause pneumonia.] *D. C. Turk*

2422 Hansen, E. J., Robertson, S. M., Gulig, P. A., Frisch, C. F. & Haanes, E. J. (1982) **Immunoprotection of rats against *Haemophilus influenzae* type B disease mediated by monoclonal antibody against a *Haemophilus* outer-membrane protein.** *Lancet* **i**(Feb. 13), 366–368

"Infant rats passively immunised with a murine monoclonal antibody against a cell-surface-exposed outer-membrane protein of *Haemophilus influenzae* type b (Hib) were protected against systemic Hib disease induced by intraperitoneal injection of virulent Hib cells. The immunoprotection mediated by this monoclonal antibody was specific for Hib strains carrying the protein antigenic determinant that it recognised; the antibody gave no protection against disease when passively immunised animals were challenged with a heterologous Hib strain. The immunoprotection given by an antibody against a Hib outer-membrane protein suggests that Hib outer-membrane proteins have potential for development as Hib vaccines."

2423 Deneer, H. G., Slaney, D., Maclean, I. W. & Albritton, W. L. (1982) **Mobilization of nonconjugative antibiotic resistance plasmids in *Haemophilus ducreyi*.** *Journal of Bacteriology* **142**(2), 726–732

Transformation is a recognized method of transfer of small plasmids in *Haemophilus* species. In this report the authors describe the presence of a plasmid of molecular weight $23{\cdot}5 \times 10^6$ capable of mobilizing a small coexisting plasmid of molecular weight $7{\cdot}0 \times 10^6$ specifying ampicillin resistance and a second plasmid of molecular weight $4{\cdot}9 \times 10^6$ specifying sulphonamide resistance, for conjugal transfer to *Escherichia coli* and *Haemophilus* recipients. The plasmids were found in an isolate of *H. ducreyi*. Transfer of the small plasmids did not occur in the absence of the large plasmid. A derivative of the large plasmid was found to contain an ampicillin-resistance transposon and to have retained conjugative ability. *K. C. Watson*

2424 Feldman, Yu. M. & Melnik, N. S. (1982) **[A rapid method for identification of *Corynebacterium diphtheriae* and determination of its serovar]** *Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii* (3), 18–20 [In Russian]

"A method for rapid isolation of *C. diphtheriae* and determination of its biovar is proposed. The method consists in the inoculation of the material under study into 5% blood agar, the determination of cystinase in the modified Pisou medium prepared from agar D with sodium hyposulfite added and the fermentation of starch in dishes with serum starch agar. The proposed method allows one to reduce the time necessary for the identification of *C. diphtheriae* by 18 hours."

2425 i. Campbell, A. N., Sill, P. R. & Wardle, J. K. (1981) **Listeria meningitis acquired by cross-infection in a delivery suite.** [Correspondence] *Lancet* **ii**(Oct. 3), 752–753

2426 ii. Kachel, W. & Lenard, H.-G. (1981) **Babies cross-infected with *Listeria monocytogenes*.** [Correspondence] *Ibid.*, **ii**(Oct. 24), 939–940

2427 iii. Isaacs, D. & Liberman, M. M. (1981) **Babies cross-infected with *Listeria monocytogenes*.** [Correspondence] *Ibid.*, 940

Several instances of cross-infection by *Listeria monocytogenes* are recounted and attention is drawn to other reports in the literature. Infection may follow vaginal delivery or Caesarean section and organisms can be transferred by delivery room staff or by mothers of infected infants. Although the index case was usually recognized soon after delivery, in the secondary case clinical illness typically developed only some days later, sometimes after the baby had left hospital apparently fit. The need for scrupulous attention to aseptic technique in delivery and maternity units is emphasized as is the recommendation to barrier nurse the mother as well as her infected child when listeriosis is suspected.

In the account (i) from Newcastle-upon-Tyne, England, a premature infant died from listeriosis 12 h after delivery; another baby born 15 min later in an adjacent delivery room with the same doctor in attendance later developed listerial meningitis caused by the same serotype. The child responded well to antibiotics. The second account (ii), from West Germany, reports an incident of fatal listeriosis in a premature infant which was followed some days later by a case of listerial meningitis in a child which had been delivered 8 h after the first child but in the same delivery room. The third account (iii), from Middlesex, England, describes 2 incidents of congenital listeriosis in infants born by Caesarean section. The mother of the first child affected was shown to have *L. monocytogenes* in a high vaginal swab; she was nursed in an open post-natal ward and occupied a bed adjacent to the mother of the second child affected and had nursed that baby.

C. A. Morris

2428 Niels le Souëf, P. & Walters, B. N. J. (1981) **Neonatal listeriosis: a summer outbreak.** *Medical Journal of Australia* **2**(4), 188–191

An outbreak of neonatal listeriosis affecting 12 newborn infants born in 7 hospitals in Western Australia over a 22-month period from January 1978 to October 1979 is described. Ten of the 12 incidents occurred during the three hottest months of the year (January to March) in contrast to the peak incidence of endemic listeriosis in ewes and lambs which typically exhibit infection in the spring. Infection was apparent in 11 babies within 12 h of birth but presented at one week of age in one who then developed fever and meningitis. Previous maternal obstetric histories were unremarkable and the pregnancies until the onset of labour had appeared normal. Ten of the infants were born preterm (28–38 weeks); maternal fever developed at the onset of labour in 5 instances and meconium-stained liquor was noted in 7. Typically the infants were of low birth weight and developed respiratory distress within hours of birth. Convulsions, skin rashes and abnormalities of the chest X-ray were inconstant features. Samples for culture were collected within 7 h of birth and *Listeria* was isolated from 8 of 10 blood cultures (but not from the 2 cultures taken from infants of mothers who had already received ampicillin), from 4 of 5 gastric aspirates, from 34 of 42 superficial sites (eye, ear, nose, throat, trachea, umbilicus, rectum) but not from 9 cerebrospinal fluid samples, 5 of which had been collected after the child had received antibiotics. Treatment with gentamicin, usually with penicillin, was commenced pending the culture result and then ampicillin or amoxycillin was added once the diagnosis was clear. The 2 non-survivors were the only 2 infants who did not receive ampicillin.

The one child with delayed onset of listeriosis responded satisfactorily to antibiotics; *Listeria* had been isolated from the infant's blood.

Although born in different hospitals in Western Australia, all the infants were cared for in one of two neonatal intensive care units. For such infections the mortality rate was relatively low (17%). During the years 1970 to 1980 no other cases of neonatal listeriosis have been diagnosed in this region; the reason why these infections were confined to a 22-month period is unexplained.

C. A. Morris

2429 Van Asbeck, B. S., Verbrugh, H. A., Van Oost, B. A., Marx, J. J. M., Imhof, H. W. & Verhoef, J. (1982) *Listeria monocytogenes* **meningitis and decreased phagocytosis associated with iron overload.** *British Medical Journal* **284**(Feb. 20), 542–544

A report of a case.

2430 Morandi, N., Canessa, A. & Rabagliati, A. M. (1981) Anticorpi agglutinanti *Listeria monocytogenes* in soggetti adulti sani. [*Listeria monocytogenes* **agglutinating antibodies in healthy adult subjects**] *Bollettino dell'Istituto Sieroterapico Milanese* **60**(5), 437–440

"The prevalence of antibodies to *L. monocytogenes,* type 1 and type 4b, in 334 healthy adults of Liguria [Italy] was determined by serological agglutination test.

"Agglutinins at low titer to *L. monocytogenes* are present in 22·45% of cases; in 88% of these the titer is 1:40.

"On the whole, the incidence of antibodies to *L. monocytogenes* type 1 increases with age and is higher (53·33%) than to type 4b (22·66%).

"The incidence of agglutinins to O-antigens of *L. monocytogenes* is higher than to H-antigens."

2431 Weekly Epidemiological Record (1982) **57**(9), 68–71. **Tuberculosis control (part 5): European region** [In English and French]

Tuberculosis has been declining in Europe from the beginning of the century when provision began to be made for specialized tuberculosis services, including sanatoria. The advent of effective chemotherapy has led to an acceleration of the decline.

The degree of integration of tuberculosis services into general health services varies throughout the region, but in spite of this, population coverage is regarded as satisfactory in most countries.

BCG vaccination of infants is carried out by a relatively large number of agencies. In some countries (listed) the maternity and child welfare services are responsible for it and in others it is carried on by tuberculosis dispensaries. Nevertheless there is a high coverage of children below the age of 5 years. School health services are responsible for the inclusion of BCG vaccination in their general immunization programme.

The main obstacles to integration include the conviction in some countries that tuberculosis control is the province of specialists, lack of trained staff in primary health centres, and lack of interest in the disease because it is a less important health problem than it once was.

In most countries case-finding is the work of tuberculosis dispensaries or chest clinics. Systematic mass radiography of the whole population is the rule in Hungary, Norway and Turkey. The diagnosis is confirmed bacteriologically in a

high proportion of countries, but the rate varies from 96% in Yugoslavia to 37% in Ireland and 30–33% in the Federal German Republic.

Initial treatment is usually carried on in hospital for 1–3 months. Only 40% of patients enter hospital in Spain compared with 98% in Czechoslovakia. The later ambulant treatment is supervised by tuberculosis dispensaries or chest clinics even when the treatment has been prescribed by private specialists or general medical practitioners.

The drugs most commonly used are isoniazid, streptomycin, rifampicin and ethambutol. They are provided free or cheaply in most countries. Follow-up treatment is usually ambulatory. Primary drug resistance does not exceed 7–10%.

Many countries operate national tuberculosis registers on which are based surveillance and evaluation of control methods, but generally there is a lack of uniformity in reporting and recording systems.

The problems still calling for research are listed. [Data from 19 countries are included in the report but, surprisingly, none from France or the United Kingdom.]

[For review of part 4 and references to earlier parts see *Tropical Diseases Bulletin* 1982, **79,** abstr. 1692.] *H. G. Calwell*

2432 Wardman, A. G., Williams, S. E., Curzon, P. G. D., Page, R. L. & Cooke, N. J. (1982) **Tuberculosis: who should prescribe?** *British Medical Journal* **284** (Feb. 20), 569–571

There is a world-wide movement (encouraged by the World Health Organization) to integrate tuberculosis services into general health services. The present authors, who are physicians working in an English chest clinic, have examined the quality of the treatment received by patients with tuberculosis from general physicians in a teaching hospital in order to identify therapeutic errors and their consequences. They reviewed the hospital records of 10 patients with tuberculosis in which they detected error before the patients came under their care in the chest clinic.

Clinical details relating to 3 patients are presented. (1) The first was a woman in whom tuberculous disease of the hip had been diagnosed in 1960. Spinal disease appeared in 1971. She died in 1981 of renal tuberculosis. (2) A woman was found to have tuberculosis of the hip in 1975. She died of miliary disease in 1981. (3) A woman was found to have a tuberculous abscess of the breast in 1978. After 6 weeks she developed severe peripheral neuropathy, which still persists in some degree. Treatment was irregular in the first case; there was also lack of supervision in the second case; and in the third there was overdosage of isoniazid.

The case reports illustrate errors in dosage and duration of treatment. Dosage was sometimes too low and sometimes too high, and courses were too short. The third case illustrates the toxicity of isoniazid when used in large dosage (600 mg instead of 300 mg daily), especially when pyridoxine is not given.

Full details of the regimens prescribed by the general physicians are given. Of the 10 patients in whom errors in treatment were identified, only 3 suffered consequences. The errors were all avoidable, and had they not been detected and corrected the authors believe that more failures would have occurred. Their conclusion is "that there is a strong argument for all cases of tuberculosis to be referred to a respiratory physician for chemotherapeutic management from the outset." *H. G. Calwell*

2433 Gale, G. L. (1982) **Tuberculosis in Canada: a century of progress.** *Canadian Medical Association Journal* **126**(5), 526–529

2434 Monie, R. D. H., Hunter, A. M., Rocchiccioli, K., White, J., Campbell, I. A. & Kilpatrick, G. S. (1982) **Survey of pulmonary tuberculosis in south and west Wales (1976–8).** *British Medical Journal* **284** (Feb. 20), 571–573

In 1976 the British Tuberculosis Association (BTA) recommended that patients with pulmonary tuberculosis should be treated with rifampicin and isoniazid for 9 months together with ethambutol for the first 2 months. In order to assess how widely this regimen has been adopted in Wales the authors have examined the records of patients treated in the 3 years 1976–78 in an area of the country with a population of just over 2 million. They reviewed the case notes relating to 753 notified cases.

Mycobacterium tuberculosis was cultured from the sputum of 588 patients (78%). In the 165 with negative cultures the histological findings were compatible with tuberculosis in 24, and the skiagrams of 141 showed radiological appearances suggestive of tuberculosis; 82 of these 141 were tuberculin reactors, 23 were non-reactors, and 36 had no record of tuberculin testing.

The records of 499 patients were analysed, which excluded 21 patients with incomplete records, 19 with atypical mycobacterial infections, 18 in whom the diagnosis was made only after death and 89 who died during treatment (13 deaths being thought attributable to tuberculosis).

The drugs used were rifampicin, isoniazid, ethambutol, streptomycin, and *p*-aminosalicylic acid in various combinations. Two patients received no chemotherapy. Details of the various treatments are given. During the 3 years only 98 patients were given the treatment as recommended by the BTA (16% in 1976, 21% in 1977 and 22% in 1978). It was seen that several physicians in Wales were unconvinced of its efficacy. *H. G. Calwell*

2435 Meindl, J. L. & Meindl, C. O. (1982) **Tuberculous meningitis in the 1830s.** *Lancet* **i**(Mar. 6), 554–555

2436 Enarson, D. A., Dorken, E. & Grzybowski, S. (1982) **Tuberculous pleurisy.** *Canadian Medical Association Journal* **126**(5), 493–495

"A review of the records for all cases of tuberculous pleurisy notified in Canada from 1970 through 1974 and in British Columbia from 1967 through 1976 showed that in the periods studied the annual incidence of this condition was low, just under nine cases per million population, and was declining. The disease commonly occurred a few months after a primary infection with tubercle bacilli. Bacteriologic confirmation of the diagnosis was possible in only 40% of the cases since biopsy specimens were not consistently cultured."

2437 Farcet, J. P., Binaghi, M., Kuentz, M. *et al.* (1982) **A hypereosinophilic syndrome with retinal arteritis and tuberculosis.** *Archives of Internal Medicine* **142**(3), 625–627

"A 35-year-old man was initially seen with a decrease in visual acuity, renal insufficiency, and elevation of the eosinophil count in the blood. The ocular syndrome was caused by extensive arterial occlusions of the retina. The subsequent apparition of cardiac, pulmonary, and neurologic signs fulfilled the criteria for the diagnosis of hypereosinophilic syndrome (HES). Most symptoms, including ocular, were temporarily but notably improved by hydroxyurea. The patient died after

two years. An autopsy showed an endomyocardial fibrosis and disclosed destruction of the left kidney by an active tuberculosis. A pathogenic relationship between the infectious disease and the HES is envisaged."

See also abstr. (2593).

2438 Dawson, D. J., Blacklock, Z. M., Hayward, A. J. & Walsh, M.-J. (1981) **Differential identification of mycobacteria in smears of sputum.** *Tubercle* **62**(4), 257–262

Smears were prepared from 100 sputum specimens known to contain *Mycobacterium tuberculosis* and 100 specimens known to contain opportunist (atypical) mycobacteria. They were stained by the Ziehl-Neelsen method and examined by 4 readers in 2 separate trials. The readers were asked to state whether the acid-fast bacilli (AFB) in the smears were "typical," meaning *Myco. tuberculosis,* or "atypical," meaning opportunist mycobacteria.

The overall accuracy ranged from 62·5% to 80% and consistency between the 2 trials ranged from 69·5% to 86·5%. It is concluded that experienced readers can predict with a high degree of accuracy whether the AFB in sputum smears are *Myco. tuberculosis* or opportunist mycobacteria.

[The whole exercise is based on the misconception that smear-positive subjects infected with opportunist mycobacteria are treated in a totally different manner from those infected with *Myco. tuberculosis* and, therefore, need to be identified rapidly. Standard chemotherapy with isoniazid, rifampicin and ethambutol is known to be totally effective for infections with *Myco. kansasii* and a good response is obtained in over 80% of subjects infected with the *Myco. avium-intracellulare-scrofulaceum* complex. On the other hand, segregation of smear-positive subjects infected with *Myco. tuberculosis* is necessary for at most 3 weeks once they are receiving adequate chemotherapy.] *P. A. Jenkins*

2439 Tubercle (1981) **62**(4), 273–293. **Symposium on** *Mycobacterium chelonei*

Five papers were given at a symposium held in January 1981. The first (J. M. Grange, p. 273) gives the taxonomic history of the species from its first isolation from sea turtles. Various names have been given by different investigators to this species and they include *Mycobacterium friedmannii, Myco. abscessus, Myco. runyonii, Myco. borstelense* and *Myco. salmoniphilum.* A detailed study of a large number of strains showed that they were all the same and that *Myco. chelonei* was the valid name. However, 2 groups emerged within the species: *Myco. chelonei chelonei* was predominant in Europe and *Myco. chelonei abscessus* was predominant in America and Africa. Tests are described that allow *Myco chelonei* to be distinguished from the other pathogenic rapidly growing organism *Myco. fortuitum.*

The second and third papers (P. G. Jackson, H. Keen, C. J. Noble and N. A. Simmons, p. 277; B. S. Azadian, A. Beck, J. R. Curtis *et al.*, p. 281) describe 2 subjects who were infected with *Myco. chelonei.* The first was a diabetic who developed injection abscesses at the site of her insulin injections. *Myco. chelonei* was grown from pus after 5 weeks incubation at 30°C. The subject was treated with erythromycin and co-trimoxazole and despite *in vitro* resistance to the latter the lesion resolved over a 7-month period. The subject was scrupulous in her sterilization of the syringe and needles, but as a precaution was given disposable outfits and there has been no recurrence of the abscesses.

The second subject was on maintenance dialysis and developed abscesses on the hands and feet. *Myco. chelonei* was isolated from the lesions, which gradually resolved after treatment with erythromycin, doxycycline and co-trimoxazole. *Myco. chelonei* and *Myco. fortuitum* were isolated from the water softener resin and from various parts of the dialysis circuit.

The last 2 papers describe unusual methods of identifying *Myco. chelonei.* The first (M. Goodfellow and D. E. Minnikin, p. 285) relies on two-dimensional thin-layer chromatography of whole organism methanolysates. A distinct pattern of non-polar mycolic acid esters is seen in *Myco. chelonei* that differs from that of all other mycobacteria in that oxygenated mycolates are lacking. A brief review is given of the chemistry of mycobacterial mycolic acids.

The final paper (J. Sparks and G. W. Ross, p. 289) describes a method for examining the β-lactamases in mycobacteria by isoelectric focusing. Using this method, differences were seen in the pattern of bands with different species of mycobacteria. The technique showed differences between strains of *Myco. chelonei* and it was possible to show that the strain isolated from the subject on dialysis was identical with a strain isolated from the dialysis equipment, but different from a strain isolated from the subject's home. *P. A. Jenkins*

2440 Vincúrová, M., Šipošová, E., Demková, A., Hrnčiarová, N. & Uhliarik, I. (1982) Opakované izolácie *Mycobacterium nonchromogenicum* zo spúta u troch pacientov. **[Repeated isolation of *Mycobacterium nonchromogenicum* from three patients' sputa]** *Studia Pneumologica et Phtiseologica Cechoslovaca* **42**(3), 149–155 English summary

2441 Kubín, M. & Švandová, E. (1982) Bakteriologický prukaz *Mycobacterium bovis* u lidí v období po eliminaci tuberkulózy skotu. **[Bacteriological demonstration of *Mycobacterium bovis* in humans after the elimination of tuberculosis in cattle]** *Studia Pneumologica et Phtiseologica Cechoslovaca* **42**(3), 182–187

"In the Czech Socialist Republic there were 122 notified cases of human tuberculosis caused by *M. bovis* (an average of 24) during the 1974–1978 period, i.e. 5–10 years after the termination of the programme of cattle tuberculosis inhibition in the CSSR. The patients were 83 men (average age 56 years) and 39 women (average 65 years). The latter showed a prevalence of the disease (67%) at the age of over 65 years, whereas in men 61% of the active cases were found in the productive age was identified in 87% of the patients. The highest incidence of bovine tb in humans was notified from areas noted for a previously high degree of cattle tb morbidity (Central Bohemia Region — a total of 37, and North Bohemian Region — 28 cases). In 105 patients with tb of the respiratory tract there were mostly infiltrative and disseminated forms with tissue break-down (56%); in the group of 18 extrapulmonary cases there were 10 affecting the urogenital and 6 involving the locomotor systems. Two patients were diagnosed as having a mixed infection with *M. bovis* and *M. avium.* 75% of the cases were fresh infection, the rest were relapses. Clinical symptomatology helped to identify 70% of the cases, while active screening for tb revealed only 30%. . . ."

2442 Brown, C. A. & Brown, I. N. (1982) *Mycobacterium bovis,* **BCG, modulation of murine antibody responses: influence of dose and degree of aggregation of live or dead organisms.** *British Journal of Experimental Pathology* **63**(2), 133–143

2443 Medeiros, A. A., Hedges, R. W. & Jacoby, G. A. (1982) **Spread of a "Pseudomonas-specific" β-lactamase to plasmids of enterobacteria.** *Journal of Bacteriology* **149**(2), 700–707

β-lactamases of Gram-negative organisms may be genetically determined by plasmid or chromosomal genes. Eleven types of the former are recognized, including 4 only so far recognized in strains of *Pseudomonas aeruginosa* and specifying pseudomonas-specific enzymes (PSE). Similar PSE-1 enzymes are now described in 11 isolates of Enterobacteriaceae including strains of *Escherichia coli, Salmonella enteritidis* and *Shigella sonnei.* The enzymes show similar isoelectric points, immunological reactions and substrate profiles as those specified by *Ps. aeruginosa* plasmid RPL-11. Producer strains were multiple antibiotic resistant and contained plasmids ranging in molecular weight from 37×10^6 to 130×10^6 and belonging to at least 6 incompatibility groups. *K. C. Watson*

2444 Lounatmaa, K. & Helander, I. (1982) **Ultrastructure of Gram-negative cotton bacteria with different pulmonary toxicities.** *Infection and Immunity* **35**(1), 359–362

Pulmonary toxicity (*i.e.* influx of polymorphonuclear leucocytes into the airways of guineapigs) has been attributed to the natural shedding of outer membrane material containing lipopolysaccharide from various Gram-negative bacteria. However, in an *Agrobacterium* species no shedding was seen in the electron microscope and no pulmonary toxicity was observed. The presence of capsule was not correlated with acute pulmonary toxicity seen with *Enterobacter agglomerans.* [See also abstr. 2445 below.] *Curtis G. Gemmell*

2445 Helander, I., Saxén, H., Salkinoja-Salonen, M. & Rylander, R. (1982) **Pulmonary toxicity of endotoxins: comparison of lipopolysaccharides from various bacterial species.** *Infection and immunity* **35**(2), 528–532

A comparison has been made between lipopolysaccharides (LPS) from *Enterobacter agglomerans, Citrobacter freundii* and an *Agrobacterium* sp. in terms of their chemical composition, pulmonary toxicity for guineapigs, lethal toxicity for mice and pyrogenicity for rabbits. Of the three, only LPS from *Agrobacterium* sp. differed in activity from the recognized biological activity of LPS from *Salmonella typhimurium.* It was chemically distinct, did not cause any influx of polymorphonuclear leucocytes into the airways of guineapigs (absence of pulmonary toxicity), and was only weakly toxic and pyrogenic. The changes are attributed to the differences in its chemical composition. [See abstr. 2444 above.]
Curtis G. Gemmell

2446 Dixon, S. F. & Murray, C. J. (1982) **Isolates typed by the Salmonella Reference Laboratory and the *Escherichia coli* Serotyping Laboratory during 1980.** [Correspondence] *Australian Veterinary Journal* **58**(1), 31

In 1980 the authors received 3370 isolates of salmonellae from human sources and 5 times as many non-human isolates, all of Australian origin. They report the serotypes most frequently isolated from man: *Salmonella typhimurium* (36·6%), *Salm. bovis-morbificans* (6·5%), *Salm. saint-paul* (6·2%), *Salm. chester* (3·7%), *Salm. muenchen* (3·6%), *Salm. virchow* (3·4%), *Salm. havana* (2·8%), *Salm. newport* (2·3%), *Salm. anatum* (2·3%) and *Salm. enteritidis* (2·1%). They also list the most common serotypes isolated from non-human sources.
D. W. FitzSimons

2447 Cherubin, C. E. (1981) **Antibiotic resistance of Salmonella in Europe and the United States.** *Reviews of Infectious Diseases* **3**(6), 1105–1126

"Nontyphoid salmonellosis has been said to be a zoonosis; hence, antibiotic resistance in the salmonella serotypes is thought to be derived directly from resistance in the animal reservoir. This thesis seems incorrect for the following reasons: (*1*) Typhoid and para-typhoidal salmonellae are clearly exceptions to the rule since they are restricted to human hosts. (*2*) Salmonella isolates involved in food-borne outbreaks of disease have not been notable in terms of their antibiotic resistance. (*3*) In contrast, outbreaks of nosocomial disease, transmitted from person to person and persisting for long periods, have produced and disseminated multiply resistant salmonella, such as *Salmonella wien* (another serotype without an animal reservoir) in western Europe. (*4*) In western Europe and the United States, there are often large differences between the resistance of isolates from animals and that of isolates from humans. (*5*) In most reported outbreaks of disease caused by antibiotic-resistant *Salmonella* in humans or animals, the administration of therapeutic concentrations of antibiotics has been implicated. (*6*) The role of low-concentration, growth-promoting antibiotic feed supplements has been much discussed but never has been delineated or proven. In fact, these supplements probably are totally irrelevant to the development of antibiotic resistance in *Salmonella.* With regard to *Salmonella,* there is an exception to every rule; in this case the exception is *Salmonella dublin,* which in western Europe is a highly antibiotic-resistant serotype in cattle and appears in humans with a similar — and unusual — pattern of resistance."

2448 Barrett, T. J., Snyder, J. D., Blake, P. A. & Feeley, J. C. (1982) **Enzyme-linked immunosorbent assay for detection of *Salmonella typhi* Vi antigen in urine from typhoid patients.** *Journal of Clinical Microbiology* **15**(2), 235–237

"Because typhoid fever continues to be a major cause of illness in many developing countries, there is a clear need for a sensitive and specific test that will permit rapid laboratory diagnosis of the disease. An enzyme-linked immunosorbent assay (ELISA) has recently been developed and tested, both in the laboratory and in a clinical situation, for its ability to detect Vi antigen in urine. The ELISA was capable of detecting as little as 1 ng of purified Vi antigen per ml in urine, compared with 100 ng/ml detectable by a previously tested coagglutination method. It could also detect antigen in urine diluted as much as 1:1,024 in normal urine. In tests of urine specimens from six stool culture-positive persons in a small typhoid outbreak in the United States, the ELISA detected antigen in specimens from four of the six patients. The ELISA also proved to be specific, giving no false-positive results for specimens from 50 persons who did not have typhoid fever. The apparent high sensitivity and specificity of this ELISA make it a promising test for rapid diagnosis of typhoid fever."

The fact that the urine specimens were collected at least 1 month after the onset of illness may account for the 2 negative results. The only patient known to have been still excreting *Salmonella typhi* at the time of urine collection gave a positive result and had the highest level of Vi antibodies in serum of the 6.

Frederick J. Wright

2449 Berkman, E. (1982) Ankarada salgin yapan coklu-dirençli *Salmonella typhimurium* suslarinda faj tiplendirmesi ve dirençlilik pazmidi idantifikasyono yöntemleriyle yapilmiş olan bazi çalişmalar. [**Phage typing and plasmid characterization studies done on *Salmonella typhimurium* strains isolated in an epidemic in Ankara, Turkey**] *Mikrobiyoloji Bülteni* **16**(1), 53–65 English summary

2450 BERKMAN, E. (1981) Hacettepe cocuk hastahanesi mikrobiyoloji laboratuvarinda izole edilmiş olan bazi Salmonella arizona suşlari. [**Three strains of *Salmonella arizona* isolated in a hospital in Turkey**] *Mikrobiyoloji Bülteni* **15**(2), 99–103

"We isolated three strains of *Salmonella arizona* during our routine daily laboratory work. Those isolations were made on patients who originally came from different parts of the country. Two isolations were made from the hospital four months after each other. The third isolation was made from a patient who was examined in an outpatient clinic. This communication indicates the first isolation and the presence of *Salmonella arizona* in Turkey."

2451 HELGASON, S. & OLD, D. C. (1981) **Comparison of four methods of differential typing of isolates of** *Shigella sonnei*. *Journal of Hygiene,* Cambridge **87**(3), 339–355

The purposes of the investigation reported were to characterize isolates of *Shigella sonnei* present in Dundee and its environs over the period from 1971 to 1976 by use of colicine typing, antibiogram typing, biotyping and resistotyping. Stability of the types so identified and the discriminatory ability of the different typing methods were also examined. Typing of 1420 serologically confirmed isolates of *Sh. sonnei* from patients or symptomless excreters was undertaken. Standard published techniques for colicine typing, disc sensitivity testing of antibiotics, resistotyping and biotyping were employed.

Colicine typing identified 9 colicine types, 4 of which were previously undescribed. However, because types 4 and 4 var., determined by *col* lb, and type U, producing no colicines, accounted for 96% of the isolates, the discriminatory power of colicine typing was considered poor. Thirteen different antibiogram patterns were observed, most strains showing multiple drug resistance. Resistance to kanamycin, neomycin and paromomycin (KNP), apparently related to a single resistance determinant, occurred in 53% of the isolates.

Analysis of data for 286 epidemiologically distinct episodes showed that variability of colicine and antibiogram characters was usually associated with loss or gain of a plasmid ("*col* lb – KNP") which determined production of colicine lb and KNP resistance.

Resistotyping with 6 chemicals differentiated 8 epidemiologically valid resistotypes, including 3 new types, although 93% of isolates tested belonged to only 3 resistotypes. Variability of resistotype characters occurred in low frequency. Definitive times for reading biotyping tests were required to discriminate between prompt and late fermenting types. Of the 13 "sugars" tested only maltose and rhamnose gave satisfactory differentiation and although the ability to ferment rhamnose was a stable property it differentiated only 1·5% of the minority late-fermenting types. From these results the authors conclude that resistotyping characters are less subject to variation *in vivo* and *in vitro* than some markers associated with the other typing methods. Resistotyping was thus considered a more valuable epidemiological tool in this survey. *Diana Martin*

2452 OLD, D. C., HELGASON, S. & SCOTT, A. C. (1981) **Discrimination by multiple typing of isolates of** *Shigella sonnei* **in Dundee (1971–6).** *Journal of Hygiene,* Cambridge **87**(3), 257–368

"Different strains of *Shigella sonnei* present in Dundee from 1971 to 1976 were identified by a 'multiple typing' method in which resistotyping, used as the main method of differentiation, was supplemented by colicine typing, antibiogram

testing and biotyping. At least 19 different 'multiple types' (MTs) were identified by combining information from the four typing techniques. The relation of the different types and their possible derivation from each other are discussed.

"The practical value of multiple typing was demonstrated in a study of 247 isolates, of three distinct MTs, recovered from 178 persons involved in an extended outbreak centred primarily on day nurseries.

"A few episodes that yielded isolates of different resistotypes were analysed to determine whether the cultures were: isolates of the same strain different in resistotype as a result of *in vivo* or *in vitro* variation of resistotype characters, or isolates of distinct strains of different resistotypes.

"The multiple typing approach clarified the way in which different MTs emerged, persisted, disappeared or co-existed in the community during the 6 years of the study."

2453 Sansonetti, P. J., Kopecko, D. J. & Formal, S. B. (1982) **Involvement of a plasmid in the invasive ability of** *Shigella flexneri*. *Infection and Immunity* **35**(3), 852–860

"Representative *Shigella flexneri* strains were studied to determine whether plasmids are involved in their virulence. All invasive *S. flexneri* strains, irrespective of serotype, were found to harbor a large plasmid of about 140 megadaltons in size, although some strains carried additional plasmid species. Spontaneous variants of strains of serotypes 1, 2, and 5 had lost this 140-megadalton plasmid and had concomitantly become avirulent, i.e. could neither invade HeLa cell monolayers nor produce keratoconjunctivitis in guinea pigs. To monitor plasmid transfer, the 140-megadalton plasmid of strain M90T (serotype 5) was tagged with the kanamycin resistance transposon Tn5. This tagged plasmid, pWR110, was not self-transmissible, but was mobilized by one of several different conjugative plasmids into avirulent derivatives of the heterologous serotypes 1 and 2 which had lost the comparable large plasmid. Transconjugants of both serotypes which had received pWR110 regained virulence. These data directly demonstrate that this large *S. flexneri* plasmid encodes or regulates some function(s) required for epithelial cell penetration."

2454 Kleganov, V. K. (1982) [**Frequency of the isolation of enteropathogenic and enterotoxigenic** *Escherichia* **from adult patients with diarrhoea**] *Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii* (2), 70–73 [In Russian]

"Enteropathogenic *E. coli* (EPEC), among which enterotoxigenic *E. coli* (ETEC) constituted 90%, were detected in the fecal specimens from 42% of hospitalized patients by means of the bacteriological method and experimental models. 209 out of 479 patients, including 9 cases of yersiniosis, provided 180 findings. All previously known invasive EPEC (12 strains belonging to 7 serovars) and ETEC (76 strains belonging to 20 serovars), isolated in the bacteriological study, were found to be invasive or toxigenic in animal experiments. This indicated that the method of serotyping could be suitable for the diagnosis of escherichiosis in practical laboratories. Suckling mice were used to detect ETEC additionally in 54·7% of patients, which increased the total frequency of findings to 43·6%. The isolated bacteria were found to be etiologically linked with diarrheal diseases observed in the patients, which was demonstrated by the results obtained in the determination of their content in the inoculated cultures and in the survey of 452 healthy persons (the frequency of isolation from seed material was 2·4%, the frequency of findings on the model was 7%, the total frequency of findings was 5·8%)."

2455 Bettelheim, K. A. & Wilson, M. W. (1982) **The enterotoxigenicity of strains of *Escherichia coli* isolated from the faeces of healthy people and cattle.** *Journal of Hygiene*, Cambridge **88**(1), 121–123

Of 197 strains of *Escherichia coli* isolated from mothers and healthy babies (90), from consecutive stools of a healthy nurse (69), and from cowpats (38) 6 strains belonging to 5 different serotypes were enterotoxigenic. Four of the strains produced a heat-labile toxin and 2 a heat-stable toxin. *Curtis G. Gemmell*

2456 Kleganov, V. K.; Romanenkova, N. I. (1982) [**Use of broth cultures grown under stationary conditions for obtaining *Escherichia* enterotoxins. I. Study of preparations obtained from standard enterotoxigenic *Escherichia* strains**] [Kleganov] *Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii* (3), 45–48 [**II. Study of preparations obtained from *Escherichia* isolated from diarrhoea patients**] [Romanenkova & Kleganov] *Ibid.*, 63–66 [In Russian] English summaries

See also abstr. 2293.

2457 Brenner, D. J., Davis, B. R., Steigerwalt, A. G. *et al.* (1982) **Atypical biogroups of *Escherichia coli* found in clinical specimens and description of *Escherichia hermanii* sp. nov.** *Journal of Clinical Microbiology* **15**(4), 703–713

Using DNA relatedness the authors showed that many biochemically atypical strains belonged to biogroups of *Escherichia coli*. However, one interrelated group was distinct — only 35–45% relatedness. The authors propose the name *Esch. hermanii* for this group of organisms that was formerly called Enteric Group 11 by the Enteric Section of CDC, Atlanta. In the U.S.A. 29 strains of *Esch. hermanii* have been isolated from various clinical sources (principally wounds (50%), sputum (25%) and stools (20%)). In addition 3 strains were isolated from food. Strains of *Esch. hermanii* are Gram-negative, oxidase-negative, fermentative, motile rods. Biochemical characteristics are reported in detail.

D. W. FitzSimons

2458 Casewell, M. W. & Phillips, I. (1981) **Aspects of the plasmid-mediated antibiotic resistance and epidemiology of *Klebsiella* species.** *American Journal of Medicine* **70**(2), 459–462

Plasmid-mediated multiple antibiotic resistance was demonstrated in 81% of 108 epidemiologically distinct strains of *Klebsiella* sp. Most strains were resistant to at least 10 commonly used antibiotics. *In vitro* conjugation was apparently demonstrated by transfer of the same plasmid (incompatibility group M) to *Escherichia coli* and *Citrobacter* in a patient with a neurogenic bladder.

The authors propose that amikacin and cefuroxime, to which 89% and 91% of the strains were sensitive, should be reserved for the treatment of gentamicin-resistant *Klebsiella* infections and they also stress that ampicillin/amoxycillin and co-trimoxazole can both select for these strains. Skin carriage accompanying faecal excretion may give rise to contamination of the hands of the staff and sustain a nosocomial outbreak.

In conclusion the authors recommend several measures for the control of outbreaks of infection including surveillance, isolation of the patient, the use of disposable aprons and effective handwashing and, perhaps more controversially, the cessation of (non-specific) antibiotic treatment if possible.

[This article is the text of an excellent talk given at an international conference and thus it gives an overview of *Klebsiella* epidemiology without detailing methods.] *T. L. Pitt*

2459 Casewell, M. W., Talsania, H. G. & Knight, S. (1981) **Gentamicin-resistant *Klebsiella aerogenes* as a clinically-significant source of transferable antibiotic resistance.** *Journal of Antimicrobial Chemotherapy* **8**(2), 153–160

Gentamicin(GM)-resistant *Klebsiella* species are often multiple antibiotic resistant. This paper attempts to define (a) the frequency with which GM-resistant *Klebsiella* are able to transfer resistance determinants, (b) whether one or more plasmids are involved and (c) to assess the spread of "epidemic" plasmids in hospital.

The study comprised 108 epidemiologically distinct strains of GM-resistant *Kl.aerogenes* collected in 12 hospitals in 6 countries [*Abstr. Hyg.* 1981, **56,** abstr. 2323]. 80% transferred multiple antibiotic resistance to *Escherichia coli* K12. Single plasmids of molecular weights varying from 25 to 130 $\times 10^6$ were responsible in 90% of successful donors. 48% of the donors transferred resistance to chloramphenicol, tetracycline, sulphamethoxazole and ampicillin/carbenicillin and resistance to at least 2 aminoglycosides and one or more cephalosporins. Of strains resistant to chloramphenicol, tetracycline, ampicillin/carbenicillin, sulphamethoxazole, gentamicin and trimethoprim transfer occurred in 89%, 75%, 74%, 74%, 67% and 58% of strains respectively. Results suggested that *Klebsiella* species are an important source of multiply resistant organisms and 6 "epidemic" type plasmids were found in 21 different serotypes in hospitals in London, Munich and Sydney. *K. C. Watson*

2460 Onokodi, J. K. & Wauters, G. (1981) **Capsular typing of Klebsiellae by coagglutination and latex agglutination.** *Journal of Clinical Microbiology* **13**(4), 609–612

The capsular serotype of *Klebsiella* spp. is usually demonstrated by capsular swelling (Quellung reaction) or direct agglutination in antisera. This paper describes two alternative methods either with staphylococci, rich in protein A, or polystyrene latex particles coated with capsular-type antibody.

The strain to be typed was grown on agar to encourage capsulation and the growth was suspended in saline. After centrifugation to remove the cells, the supernatant fraction was mixed with either of the antibody-coated carrier particles. The results on a limited number of strains with only 5 antisera were encouraging and coagglutination may be less expensive than conventional tests. Problems such as cross-reactions may be revealed when or if the full set of 72 sera is evaluated by this test. *T. L. Pitt*

2461 Bongaerts, G. P. A., Bruggeman-Ogle, K. M., De Raad-Slootweg, J. M. C. & Mouton, R. P. (1981) **Proteus-typing by proticin production and susceptibility.** *Antonie van Leeuwenhoek* **47**(6), 525–538

The authors describe a modified method of proticin-production typing (P-typing) and proticin-susceptibility typing (S-typing) for combined use in the epidemiological study of *Proteus* infections. Mitomycin-induced proteins were prepared from broth cultures of producer strains. Proticins were applied to agar plates which were then dried and overlaid with an indicator culture. Ten proticin preparations were used to determine susceptibility patterns (S-types) of test

strains. An indicator set of 28 strains was used for the typing of strains for detection of different proticin activities (P-types).

Standardization of the temperature for proticin production was found necessary, proticins produced at 37 °C being more stable than those produced at 25 °C.

When the system was tested with 148 strains from clinical sources 28 S-types and 34 P-types were observed. A combination of the two systems allowed recognition of 86 S-P types. Only 7 strains were not typable. Reproducibility of typing patterns in epidemiologically related strains was shown. These workers suggest that the method is useful for the typing of strains of *Proteus vulgaris* and *Pr. mirabilis* but inappropriate for the typing of *Pr. rettgeri* and *Pr. morgani.*

Diana Martin

2462 Vassiliadis, P., Mavrommati, C., Papadakis, J. A. & Série, C. (1981) Enterite a *Campylobacter* dans la région de l'Attique. [*Campylobacter* **enteritis in the region of Attica, Greece**] *Archives de l'Institut Pasteur Hellénique* **26**, 45–53 English summary

During 1979–80 the authors investigated the incidence of *Campylobacter* in the faeces of persons living in the Attica region of Greece. *C. jejuni/coli* was isolated from 7 out of 190 children aged under 14 years admitted temporarily to an institution. There were also 45 isolations of *Salmonella* and 15 isolations of specific *Escherichia coli.* There were no isolations of *C. jejuni/coli* from 35 adults. *C. jejuni/coli* was isolated from only 4 out of 117 children under the age of 2 years with gastroenteritis admitted to a paediatric hospital but there were 5 isolations of *Salmonella,* 6 of *Shigella,* and 14 of pathogenic *Esch. coli.*

They isolated *C. jejuni/coli* from the faeces of 23 out of 50 healthy dogs but made no isolation from 99 horses, 15 sheep or 25 bulls.

They conclude that *Campylobacter* infection is not an important cause of gastroenteritis in this particular region of Greece, and postulate that dogs might be the source of human infection. *W. Kwantes*

2463 Cawley, P. F. M. (1982) *Campylobacter jejuni* **isolates studied at the National Health Institute, Wellington, between January 1979 and March 1981.** *New Zealand Medical Journal* **95**(Jan. 27), 35

This is not so much a study of *Campylobacter* isolates as of the patients from whom they were isolated. 221 *C. jejuni* isolates were received from 22 laboratories over a period of 27 months. This isolation rate was intermediate between those of *Salmonella* and *Shigella.* The age and sex distribution of cases was similar to that in Britain. People of all ages were affected but most patients were under 30 years old. There was a slight preponderance of male patients. There was no apparent seasonal variation in the incidence of infection. *M. B. Skirrow*

2464 Figura, N. & Rossolini, A. (1981) *Campylobacter jejuni* **enteritis in Italy.** [Correspondence] *Bollettino dell'Istituto Sieroterapico Milanese* **60**(5), 444–445

The authors claim the first isolation of *Campylobacter jejuni* in Italy, from a stool of a 20-month-old baby with recurrent diarrhoea.

2465 Doyle, M. P. & Roman, D. J. (1982) **Response of** *Campylobacter jejuni* **to sodium chloride.** *Applied and Environmental Microbiology* **43**(3), 561–565

2466 Véron, M., Lenvoisé-Furet, A. & Beaune, P. (1981) **Anaerobic respiration of fumarate as a differential test between** *Campylobacter fetus* **and** *Campylobacter jejuni. Current Microbiology* **6**(6), 349–354

"The effect of formate and of various electron acceptors—fumarate, aspartate, or nitrate—on the growth of 36 catalase-producing *Campylobacter* strains was quantitatively investigated in a semisynthetic medium, under aerobic (5% oxygen, 10% carbon dioxide, 85% nitrogen) or anaerobic (10% carbon dioxide, 90% nitrogen) conditions. Under anaerobic conditions, 24 strains of *C. jejuni* failed to grow, or grew poorly, in the presence of fumarate, whereas ten strains of *C. fetus* subsp. *fetus* and two strains of *C. fetus* subsp. *venerealis* grew abundantly, rather better than under aerobic conditions. The quantitative differences of growth yields were very significant between the two species with fumarate, but less pronounced with aspartate or nitrate. The activity of fumarate-reductase in *C. fetus* was substantiated by identification of relevant metabolites by gas liquid chromatography and by mass spectrometry. The anaerobic fumarate respiration in the genus *Campylobacter* has taxonomic implications."

2467 Chan, F. T. H. & Mackenzie, A. M. R. (1982) **Enrichment medium and control system for isolation of** *Campylobacter fetus* **subsp.** *jejuni* **from stools.** *Journal of Clinical Microbiology* **15**(1), 12–15

Plates of Columbia agar made selective with 7% lysed horse blood and vancomycin 10 μg, trimethoprim 5 μg and polymyxin 50 IU (latterly) per ml were inoculated with faeces or rectal swabs and incubated for 24 h at 42 °C in a jar swept through for 15 s with a mixture of 10% CO_2, 5% O_2 and 85% N_2. When the atmosphere was satisfactory, there was good growth of *Clostridium perfringens, Pseudomonas aeruginosa* and *Campylobacter fetus* ssp. *jejuni* together on a single plate of blood agar. Each of the rectal swabs or swabs of the faeces was broken off into 5 ml vials of motility test medium (0·4% agar) with (latterly) the same additives as the direct plates, incubated overnight at 42 °C and then sown (the actual swab ensuring the necessary deep sampling of the vial) on selective plates. From 7224 specimens 120 isolations were made on direct plate and 127 through enrichment.

P. B. Crone

2468 Bauwens, L. & De Meurichy, W. (1981) **The occurrence of thermophilic campylobacters in zoo animals.** *Acta Zoologica et Pathologica Antverpiensia* (76), 181–189

Faecal samples from 208 mammals and 132 birds in Antwerp Zoo were examined for "thermophilic" campylobacters. Waterfowl and other birds living in close contact with water (*e.g.* penguins, herons, flamingoes and gulls) gave the highest isolation rate (37%). The rates for other birds and mammals were 10% and 12% respectively. Rather surprisingly, none of 33 Bovidae was positive.

M. B. Skirrow

2469 Smith, C. E. (1982) **The Broad Street pump revisited.** *International Journal of Epidemiology* **11**(2), 99–100

"This historical note examines the effect of population migration on the number of fatal cholera cases reported by John Snow in the Golden Square area of London during the fall of 1854. A method to correct for population migration is given and its relevance to present day epidemiological studies discussed." [See also *Tropical Diseases Bulletin* 1982, **79**, 1.]

2470 Szeness, L., Sey, L. & Szeness, Á. (1981) Zártan és szabadon tartott háziállatok, mint az emberi nem-kolera vibrió (NCV) fertözések potenciális forrásai. **[Domestic animals kept in isolation or free as potential sources of non-cholera vibrio infections]** *Egészségtudomany* **25**(4), 395–400 English summary

Potential sources of non-cholera vibrio infection in humans from domestic animals kept in isolation or free were studied in Hungary. Non-cholera vibrios were isolated from the faeces of 21·4% of ducks living near water but in only 1·6% living at a distance from surface water. 11·6% of geese living near water were faecal carriers but no carrier was found among those living far from water. Other domestic animals tested were free from non-cholera vibrios. More than half the migratory birds originating in Africa may be vibrio carriers, possibly infecting fish and frogs native to Hungary, which may result in infection of ducks and geese who live on these animals. If the poultry is properly cooked there should be no infection from this source. However, occasional cases of cholera may occur through infection from migratory birds and without contact of the patient with other patients with the infection. *G. W. Csonka*

2471 Milyutin, V. N., Somova, A. G., Medinskii, G. M. *et al.* (1981) **[NAG vibrio, serovar 2, causing generalized infection]** *Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii* (3), 24–25 [In Russian]

"A case of septicemia caused by NAG-vibrio, serovar 2, is described. In contrast to other vibrios, the strain under study was immobile at the moment of isolation and, when introduced enterally into suckling rabbits, showed the capacity of causing generalized infection." [The patient, a 49-year-old man, presented in a state of collapse and died 32 h after the beginning of his illness.]

2472 Saxa, V., Poráziková, T. & Karolček, J. (1981) Prenosná rezistencia na antibiotiká u NAG-vibrií. **[Transmitted resistance to antibiotics in NAG vibrio]** *Československá Epidemiologie, Mikrobiologie, Imunologie* **30**(6), 328–333

"The authors investigated 195 strains of so-called non-cholera (NAG) vibrio isolated mostly from surface waters. In these strains the sensitivity to antibiotics and sulphamethoxidine was examined qualitatively by the disc method. In resistant strains the minimum inhibiting concentration (MIC) was assessed by the dilution method.

"The investigated group included 17 monoresistant strains, 168 multiresistant strains. The strains were insensitive to all tested preparations. In particular resistance to β-lactam antibiotics was involved. The highest percentage of strains was resistant to ampicillin (86·15%), followed by cephaloridine (67·19%) and carbenicillin (66·15%). Resistance to colistin, streptomycin and sulphamethoxidine was more rare. Combined resistance was most frequent against β-lactam antibiotics (ampicillin, cephaloridine and carbenicillin) in as many as 38 cases. The highest levels of resistance were detected for carbenicillin (1500–2000 μg/ml), for ampicillin (more than 128 μg/ml) and for cephaloridine (16–64 μg/ml).

"In resistant strains where the resistance level (MIC) was higher than 100 μg/ml the possibility of their transfer to the reference strain *Escherichia coli* K-12 3110 was investigated. From 95 selected strains ampicillin resistance was transmitted in 58 instances (61·05%). Resistance to carbenicillin was transmitted in 5 instances (5·26%). The authors were unable to transmit cephaloridine resistance."

2473 Lockwood, D. E., Kreger, A. S. & Richardson, S. H. (1982) **Detection of toxins produced by** *Vibrio fluvialis*. *Infection and Immunity* **35**(2), 702–708

Vibrio fluvialis, a halophilic bacterium now recognized as a potential enteric pathogen for man, has been shown to produce an enterotoxin similar to that elaborated by *Vibrio cholerae* and *Escherichia coli* (the heat-labile toxin). Its synthesis was impaired by lincomycin (1 μg/ml). The biological activity of this new toxin was measured by elongation of Chinese hamster ovary cells. Its biological activity was neutralized by heat (60° or 100°C), its molecular weight was estimated by gel filtration to be 135 000 and it had an isoelectric point of 5·1.

The organism also elaborated a cytolysin active against rabbit erythrocytes, a factor which killed Chinese hamster ovary cells (whose synthesis was stimulated by lincomycin), and a protease with activity against azocasein.

Curtis G. Gemmell

See also abstr. (2298).

2474 Sinclair, M. I., Asche, V., Morgan, A. F. & Holloway, B. W. (1981) **Plasmid-determined tobramycin and gentamicin resistance in strains of** *Pseudomonas aeroginosa* **from two Sydney hospitals.** *Medical Journal of Australia* **2**(6), 283–287

Transmissible plasmid-borne resistance to gentamicin and tobramycin was found in strains of *Pseudomonas aeruginosa* isolated over one year. Thirteen patients were infected with strains that carried apparently identical plasmids which conferred resistance, in addition to the antibiotics mentioned, to streptomycin, sulphanilamide, mercury (II) ions and potassium tellurite. The level of gentamicin resistance conferred (MIC > 50 μg/ml) was much higher than in other previously identified plasmids. The plasmids were all of the Inc P-2 group and pyocin typing revealed at least 6 distinct types. *T. L. Pitt*

2475 Burke, V., Robinson, J., Atkinson, H. M., Dibley, M., Berry, R. J. & Gracey, M. (1981) **Exotoxins of** *Aeromonas hydrophila*. *Australian Journal of Experimental Biology and Medical Science* **59**(6), 753–761

103 strains of *Aeromonas hydrophila* have been examined for the production *in vitro* of enterotoxin, cytotoxin and haemolysin. The heat-labile enterotoxin, detectable equally well in the suckling mouse test and by perfusion through rat jejunal tissue, was found in 80 of the strains. Enterotoxin activity correlated with haemolysin and cytotoxin production, but 4% of the strains would have been wrongly classified by measuring the haemolysin instead of the enterotoxin and 11% would have been wrongly classified by measuring the cytotoxin instead of the enterotoxin. *Curtis G. Gemmell*

2476 Blackmon, J. A., Chandler, F. W. & Cherry, W. B. *et al.* (1981) **Legionellosis.** *American Journal of Pathology* **103**(3), 427-465 [175 references]

2477 Fleurette, J. & Bornstein, N. (1981) Bilan d'activité en 1980 du Centre National des Légionelloses. **[Report of the Legionellosis National Centre, France, in 1980]** *Revue d'Epidémiologie et de Santé Publique* **29**(4), 399–404

"Serological diagnoses have been performed for 411 [cases of] pneumonia; 27 cases were confirmed. Tracheal aspirates were seldom sampled: in two occasions, direct immunofluorescence reaction was positive; in one case, a strain of *Legionella*

pneumophila serogroup 1 was cultivated from [the spleen of a guineapig] inoculated with tracheal aspirate. Clinical and epidemiological characteristics of Legionnaires' disease are quite similar in France and in USA or United Kingdom."

2478 GERBER, J. E., CASEY, C. A., MARTIN, P. & WINN, W. C. Jr (1981) **Legionnaires' disease in Vermont, 1972–1976.** *American Journal of Clinical Pathology* **76**(6), 816–818

2479 STOUT, J., YU, V. L., VICKERS, R. M. *et al.* (1982) **Ubiquitousness of *Legionella pneumophila* in the water supply of a hospital with endemic Legionnaires' disease.** *New England Journal of Medicine* **306**(8), 466–468

Between November 1980 and March 1981 six nosocomial cases of Legionnaires' disease occurred in the Pittsburgh Veterans Administration Medical Center which were due to *Legionella pneumophila* serogroup 1. This serogroup of *L. pneumophila* was isolated from the water and sediment of the showers or faucets used by 5 of these 6 patients within one week of the onset of their pneumonia by means of direct culture methods on buffered charcoal yeast agar plates. The organism was subsequently found to be ubiquitous in the water-distribution system of the hospital, and during a period of 3 weeks a nosocomial outbreak of 14 cases of culture proven Legionnaires' disease occurred.

Results from this study, as with earlier reports from England and the U.S.A. [*e.g. Abstr. Hyg.* 1981, **56,** abstrs 2995, 3335], indicate that in institutional outbreaks of Legionnaires' disease epidemiological investigations should be focused on water-distribution systems as well as air-conditioning systems.

A. G. Taylor

2480 BAMFORD, J. M. & HAKIN, R. N. (1982) **Chorea after Legionnaires' disease.** *British Medical Journal* **284**(April 24), 1232–1233

A report of a case.

2481 JOHNSON, S. R., SCHALLA, W. O., WONG, K. H. & PERKINS, G. H. (1982) **Simple, transparent medium for study of legionellae.** *Journal of Clinical Microbiology* **15**(2), 342–344

Yeast extract (10 g), monosodium glutamate (5 g), and K_2HPO_4 (0·54 g) dissolved in distilled water (300 ml), adjusted to pH 7·4 and sterilized by filtration (not autoclaving) were added to an autoclaved solution (670 ml) of agar and starch (or water if broth was desired); then 10 ml each of filtered solutions of cysteine hydrochloride (6 mg/ml), iron(III) pyrophosphate (2·5 mg/ml) and haemin (2 mg/ml) were added; the final pH was 6·9. Counts of suspensions from agar of 7 out of 9 strains of *Legionella* were not reduced on the new medium in comparison with charcoal yeast extract medium; even the most reduced strain on the new medium yielded 0·3 of the counts on the latter. Colonies from embryonated eggs appeared sooner on the new medium. The medium may prove useful for testing sensitivity (Mueller-Hinton medium is not satisfactory and media with charcoal could never be trusted) and production of antigens. *P. B. Crone*

2482 COMMUNICABLE DISEASE SURVEILLANCE CENTRE, PUBLIC HEALTH LABORATORY SERVICE (1982) **Anthrax surveillance 1961–80.** *British Medical Journal* **284** (Jan. 16), 204

This short report reviews data on anthrax in man since it became notifiable under the Public Health Act in December 1960. In England and Wales during the

period 1961–80 there were 145 cases and 12 deaths: 127 cases were notified under the Public Health Act, 72 under the Factories Acts and 80 were reported by laboratories. 122 cases were associated with occupation (one case of pulmonary anthrax is included and some other details of occupation and sites of lesions are noted); of the 23 cases not associated with occupation (including 2 cases of pulmonary anthrax) 15 were in persons who had handled bones or bone meal. The report concludes:

"The number of reported cases of anthrax declined fourfold between 1961–5 and 1976–80 and it is now a rare disease. The decline took place mainly in the 1970s, but in the wool, hair, and bristle industries, traditionally associated with the disease, it took place in the mid-1960s, corresponding in time with the introduction of vaccination against anthrax for these workers in 1965. Bone meal still poses a risk both in industry and the general population, but even this risk has probably declined since the introduction of labelling of the unsterilised product in 1978." *Elizabeth M. Illingworth*

2483 Ritterson, A. L. (1982) **Valentine's day: is love really a zoonosis?** [Correspondence] *New England Journal of Medicine* **306**(6), 372–373

Love sickness and brucellosis have many symptoms in common: malaise, recurrent depression, aching and perhaps a touch of fever in the evening. Goats may have a place in the aetiology of both affections. In brucellosis this is clear; in the other, perhaps more serious, malady the infection originally came from the long thongs of goat skin with which the luperci, or priests, flogged all and sundry during the Lupercalia festival in ancient Rome. This apparently purified the flogged ones and cured barrenness in women. [The thongs were called *februa* from *februare,* to purify. The Lupercalia was celebrated on 15 February. Did the month take its name from the thongs, did the lupus or wolf that suckled Romulus have anything to do with the celebration, and did our St Valentine's Day somehow get mixed up with or supplant it? According to Livy the whole thing had something to do with the word *lupa,* the she-wolf, a word which also meant a common whore. It is all very disturbing.] *A. B. Christie*

2484 Weekly Epidemiological Record (1981) **56**(48), 380–381. **Brucellosis surveillance** [In English and French]

The annual number of reports of human cases of brucellosis in England and Wales continues to fall, a decline correlating with the eradication of brucellosis in cattle. In 1980 there were 17 cases of *Brucella abortus* (or unspecified *Brucella* infection) and 5 cases of *Br. melitensis* compared with a total of 212 cases in 1969, a year when the compulsory eradication scheme in cattle had not yet started. During the 5-year period 1976–80 there were 254 reports of brucellosis in human beings, 19 of which were caused by *Br. melitensis* and almost invariably acquired abroad.

Infection was four times as common in men as in women, was usually associated with an occupational risk of exposure to infected cattle or the drinking of raw milk, and typically affected adults of working age. Over half of those affected were farm workers and 10% were veterinary workers. Although the numbers were small, there had been no obvious decline of brucella infections among slaughter-house workers or carcass handlers, who therefore made up a larger proportion of the total affected. The number of cases among people who did not live on farms and among those whose only known exposure was drinking raw milk has dropped significantly. *C. A. Morris*

2485 Naparstek, E., Block, C. S. & Slavin, S. (1982) **Transmission of brucellosis by bone marrow transplantation.** [Correspondence] *Lancet* **i**(Mar. 6), 574–575

2486 Zheludkov, M. M. (1982) **[Role of cross-reactions in the serodiagnostic evaluation of brucellosis in humans. I. Results of the examination of patients with chronic brucellosis in the agglutination test and Coombs' test with** *Brucella* **and** *Yersinia* **(serotype O9) antigens]** *Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii* (4), 37–40 [In Russian]

"The study of blood serum samples obtained from 187 patients with chronic brucellosis revealed that in those cases when blood serum contained specific antibrucella antibodies cross reactions with *Yersinia enterocolitica* O-9 antigen occurred in the agglutination test and Coombes' test. The results thus obtained showed that *Y. enterocolitica* O-9 antigen could be used for detecting mainly 2-mercaptoethanol-sensitive complete and incomplete antibodies (IgM). This study indicates that serological cross reactions play an important role in the evaluation of the specific methods for diagnosing brucellosis."

2487 Dubyanskii, M. A., Dubyanskaya, L. D., Kochkina, L. I., Milin, V. M. & Zhubanazarov, I. Zh. (1982) **[Prognosis of the epizootics of plague among wild rodents]** *Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii* (3), 97–100 [In Russian] English summary

2488 Gaislerová, V., Janousková, I., Kadlcáková, E. & Gregorová, J. (1982) *Yersinia enterocolitica* v jihomoravském kraji v období 1968–1979. [*Yersinia enterocolitica* **in South Moravia, Czechoslovakia, 1968–79**] *Ceskoslovenská Epidemiologie, Mikrobiologie, Imunologie* **31**(1), 48–54

"A total sum of 240 strains of *Y. enterocolitica* serotype 03 biotype 4 were isolated. Most of the strains were obtained by the routine cultivation technique (233 strains from the stools, one strain from urine, one strain from the pus) and a lesser portion (5 strains from appendix) by means of cultivation at 4 °C in physiological saline buffered by phosphate. In children up to 15 years there was a 3-fold higher occurrence than in the adult patients. The highest occurrence was found in the autumn and spring months. [In 3 districts there were more than 20 isolations/10^5 population over the period.] . . . In a part of the patients samples were examined by means of the method of passive hemagglutination. The highest titre proved to be 1:4096. Most strains were isolated from patients whose clinical picture was dominated by an affection of gastrointestinal tract (diarrhea, pains in the abdomen sometimes imitating appendicitis, fever up to 39 °C, vomiting)."

2489 Mavrommati, C., Vassiliadis, P., Papadakis, J. A., Messaritakis, J. & Karpathios, T. (1980) Infections à *Yersinia enterocolitica* en Grèce. Note préliminaire. [*Yersinia enterocolitica* **in Greece. Preliminary note**] *Archives de l'Institut Pasteur Hellénique* **26,** 55–58 English summary

"Six isolates of *Yersinia enterocolitica* [serotype O3] from diarrheic stools of six children are reported. Five of these children are suffering from Cooley's anemia."

2490 Karmali, M. A., Toma, S., Schiemann, D. A. & Ein, S. H. (1982) **Infection caused by** *Yersinia enterocolitica* **serotype O:21.** *Journal of Clinical Microbiology* **15**(4), 596–598

"*Yersinia enterocolitica* serotype O:21, biotype 3 (Wauters) was isolated from the appendix and stool of a 7-year-old girl. The same organism was later isolated in pure culture from pus from a postoperative wound infection in this patient. She developed a significant serological response (titer of 800). There was thus strong clinical evidence of pathogenicity associated with this rather uncommon human serotype. Laboratory studies of in vitro and in vivo pathogenicity showed that the organism was autoagglutinable, Serény test positive, and HeLa cell invasive; when given orally to mice, it produced diarrhea and subsequently death. The results of laboratory studies of virulence correlated closely with the clinical evidence of pathogenicity in this case."

2491 Agbonlahor, D. E., Odugbemi, T. & Dosunmu-Ogunbi, O. (1982) **Differential and selective medium for isolation of** *Yersinia enterocolitica* **from stools.** *Journal of Clinical Microbiology* **15**(4), 599–602

"A new differential and selective medium, DYS agar, was developed and evaluated for the isolation of *Yersinia enterocolitica.* The bile salts content of the medium resulted in high selectivity, and inclusion of arabinose, lysine, and arginine rendered *Y. enterocolitica* very distinct from *Proteus* spp., *Pseudomonas* spp., and other members of the family *Enterobacteriaceae.* . . ."

2492 Putilina, N. G., Kulagin, P. P., Burkin, V. S. & Ibragimov, F. Kh. (1982) **[Immunological characteristics of surface water-soluble** *Yersinia enterocolitica* **antigens]** *Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii* (1), 83–86 [In Russian]

"The extraction of acetone-dried bacteria by means of Tris-glycine buffer has been found to yield the greatest number of antigens. Thus, up to 16 antigenic components with different electrophoretic mobility have been revealed in *Y. enterocolitica.* They include 4 thermostable proteins and 2 glycoproteins. Such antigens may be common and specific for each serovar. The presence of 1–3 surface antigens in common with the causative agent of plague has been revealed. Of these, the most active antigen has proteinaceous nature, and its mobility corresponds to that of ϱ-globulin. It is not identical with the surface *Y. pestis* antigen located in the albumin zone."

2493 Okamoto, K., Inoue, T., Shimizu, K., Hara, S. & Miyama, A. (1982) **Further purification and characterization of heat-stable enterotoxin produced by** *Yersinia enterocolitica. Infection and Immunity* **35**(3), 958–964

See also *Abstr. Hyg.* 1981, **56,** abstr. 1049.

2494 Clumeck, N., Van Laethem, Y., Vanhoof, R., George, C., Rapin, M. & Butzler, J. P. (1982) **Cefotaxime therapy of serious infections with multiresistant Gram-negative bacilli.** *Scandinavian Journal of Infectious Diseases* **14**(1), 57–60

"33 patients with serious gram-negative bacillary infections were treated with cefotaxime. In patients with normal renal function the dose varied between 1·5 to 4 g/day. 17 patients had urinary tract infections, 5 respiratory tract infections, 1

combined urinary tract infection and respiratory tract infection, and 10 miscellaneous infections. 16 patients had septicemia. 25 infections were due to pathogens resistant in vitro to ampicillin, cephalothin, gentamicin and/or tobramycin. 15 infections had failed to respond to ampicillin, cefazolin, gentamicin or tobramycin therapy. 32/33 patients responded favourably to cefotaxime (cure or improvement) but 4 patients developed superinfection with cefotaxime-resistant bacteria. No evidence of nephrotoxicity was observed except for a transient moderate rise in creatinine in one patient."

2495 Shlaes, D. M., Dul, M. J. & Lerner, P. I. (1982) **Capnocytophaga bacteremia in the compromised host.** *American Journal of Clinical Pathology* **77**(3), 359–361

"Capnocytophaga, a CO_2-requiring gram-negative bacillus, is a recently recognized pathogen in the immunocompromised host. The authors present two cases with granulocytopenia, oral disease and bacteremia with *Capnocytophaga ochracea*. The microbiology of this genus, its clinical association with periodontal disease, granulocytopenia and oral ulceration, and its implications for the compromised host are reviewed."

2496 Poxton, I. R., Brown, R. & Collee, J. G. (1982) **Detection of species-specific and cross-reactive cell-surface antigens of *Bacteroides* species by an indirect enzyme-linked immunosorbent assay.** *Journal of Medical Microbiology* **15**(2), 223–231

2497 Rashtchian, A., Dubes, G. R. & Booth, S. J. (1982) **Tetracycline-inducible transfer of tetracycline resistance in *Bacteroides fragilis* in the absence of detectable plasmid DNA.** *Journal of Bacteriology* **150**(1), 141–147

". . . The transferability of tetracycline resistance genes in strains of *Bacteroides* emphasizes the impact of the therapeutic and subtherapeutic use of antibiotics on the development of antibiotic resistance in anaerobic bacteria. This may help explain the recent emergence of tetracycline resistance in *Bacteroides* spp."

2498 George, W. L., Kirby, B. D., Sutter, V. L., Citron, D. M. & Finegold, S. M. (1981) **Gram-negative anaerobic bacilli: their role in infection and patterns of susceptibility to antimicrobial agents. II. Little-known *Fusobacterium* species and miscellaneous genera.** *Reviews of Infectious Diseases* **3**(3), 599–626 [154 references]

"Twenty infrequently reported species of gram-negative anaerobic bacilli other than *Fusobacterium nucleatum, Fusobacterium necrophorum,* and members of the genus *Bacteroides* were studied with regard to their role in infection and their susceptibility to antimicrobial agents. In addition, the literature regarding the recovery of these organisms from both the normal flora and infections of humans was reviewed. During a six-year period at the Wadsworth Clinical Anaerobic Bacteriology Research Laboratory (Veterans Administration Wadsworth Medical Center, Los Angeles, Calif.), 39 (6%) of 679 specimens obtained from anaerobic infections yielded 'other gram-negative anaerobic bacilli' (OGNAB). *Fusobacterium naviforme, Fusobacterium gonidiaformans, Fusobacterium varium, Fusobacterium mortiferum,* and *Fusobacterium russii* were the most commonly isolated OGNAB. Most of the OGNAB tested were resistant to erythromycin, and most strains, except for *F. varium,* were susceptible to β-lactam antibiotics and clindamycin. Chloramphenicol and metronidazole were active against all strains of

OGNAB tested. Certain *Fusobacterium* species are undoubtedly previously unrecognized members of the normal flora of the oropharynx, upper respiratory tract, or urogenital tract and may be present in infections derived from these floras."

2499 LANCET (1982) **i**(Mar. 27), 722. *Acinetobacter* **pneumonia.** [Editorial]

2500 GOETZ, M. B. & JONES, J. (1982) **Pneumonia and bacteremia caused by a previously undescribed** *Moraxella*-**like bacterium.** *Journal of Clinical Microbiology* **15**(4), 720–722

2501 CATO, E. P., HASH, D. E., HOLDEMAN, L. V. & MOORE, W. E. C. (1982) **Electrophoretic study of** *Clostridium* **species.** *Journal of Clinical Microbiology* **15**(4), 688–702

"Polyacrylamide gel electrophoretic analyses of soluble cellular proteins (without sodium dodecyl sulfate) of 70 *Clostridium* species indicated that the procedure was readily applicable to the differentiation of species in the genus. The protein patterns correlated well with the available DNA homology data and with most accepted differential tests. Results indicated that several earlier names for species were synonyms of those of accepted species and that two accepted species may be synonymous."

2502 NEUBAUER, M. & MILÁČEK, V. (1981) **Infant botulism type B in Central Europe.** *Zentralblatt für Bakteriologie I* **250A** (4), 540–547

Infant botulism was described by American authors in 1976 (*New England Journal of Medicine* 1976, **295,** 770); now increasing numbers of case reports are appearing from other countries. In this paper a case of moderately severe botulism in a 4-week-old girl is reported from Czechoslovakia. *Clostridium botulinum* type B and its toxin were demonstrated in an extract of the faeces. The infant was fed by nasogastric tube for more than 3 weeks; recovery took 60 days. Treatment included ampicillin and later penicillin. *Elizabeth M. Illingworth*

2503 PATON, J. C., LAWRENCE, A. J. & MANSON, J. I. (1982) **Quantitation of** *Clostridium botulinum* **organisms and toxin in the feces of an infant with botulism.** *Journal of Clinical Microbiology* **15**(1), 1–4

A case of infant botulism in a 4-month-old boy is reported from Adelaide, south Australia. *Clostridium botulinum* type B and type B toxin were detected in the faeces, and their concentrations were measured at intervals throughout the infant's 4-week period in hospital. The maximum number of organisms ($8{\cdot}4 \times 10^6$/g) and maximum amount of toxin (61 440 mouse 100% lethal doses/g) were found in a specimen taken 16 days after admission: by this time a substantial improvement in the patient's condition had taken place.

This type of study of cases of infant botulism should help towards a better understanding of the disease and the development of a more specific and effective treatment. *Elizabeth M. Illingworth*

2504 THOMAS, D. F. M., FERNIE, D. S., MALONE, M., BAYSTON, R. & SPITZ, L. (1982) **Association between** *Clostridium difficile* **and enterocolitis in Hirschsprung's disease.** *Lancet* **i**(Jan. 9), 78–79

A mortality rate of 5–10% from postoperative enterocolitis after corrective surgery for Hirschsprung's disease is quoted (*British Journal of Surgery* 1980, **67,** 436).

In this study *Clostridium difficile* was isolated from the faeces of 5 of 6 patients with Hirschsprung's disease, cytopathic toxin was detected in 4 out of 6, and 2 out of 4 patients had histological evidence of pseudomembranous colitis (PMC). Unlike typical PMC due to *Cl. difficile* "there was little or no link" with antibiotic therapy. The authors consider that this evidence suggests a causal relation between *Cl. difficile* and enterocolitis in Hirschsprung's disease; they point out that cholestyramine, which is said to bind *Cl. difficile* toxin, has been found useful in the management of such cases. They recommend the postoperative screening of patients with Hirschsprung's disease for *Cl. difficile* and its toxin, and isolating patients with resulting enterocolitis to avoid cross-infection.

Elizabeth M. Illingworth

2505 Richardson, S. A., Brookfield, D. S. K., French, T. A. & Gray, J. (1981) **Pseudomembranous colitis in a 5-week-old infant.** *British Medical Journal* **283** (Dec. 5), 1510

Pseudomembranous colitis due to *Clostridium difficile* has rarely been reported in infants. Donta *et al.* [*Abstr. Hyg.* 1981, **56,** abstr. 3016] described a case of a neonate treated with ampicillin [and Adler (*American Journal of Diseases of Children* 1981, **135,** 820) that of a 12-week infant with no history of antibiotic treatment], although *Cl. difficile* was isolated from a considerable proportion of infants, *e.g.* 11 of 35 in a study by the authors of this report. They describe the case of an infant who was admitted with fever 2 days after amoxycillin treatment was started; he developed blood-stained stools with mucus, and intravenous ampicillin was given for suspected dysentery. Laparotomy on the fifth day "excluded a surgically treatable condition" and the infant died on the 8th day. A post-mortem examination showed extensive membrane formation, and *Cl. difficile* and its toxin were detected. This case shows the importance of considering the possibility of *Cl. difficile*-associated diarrhoea in infants especially after antibiotic therapy.

Elizabeth M. Illingworth

2506 Chang, T.-W. & Gorbach, S. L. (1982) **Rapid identification of** *Clostridium difficile* **by toxin detection.** *Journal of Clinical Microbiology* **15**(3), 465–467

Broth and agar culture techniques have been compared for the rapid detection and identification of *Clostridium difficile* and its cytotoxin. Two-day cultures of the organism in chopped meat broth are recommended for the detection of the toxin from stool specimens, and blood agar containing cycloserine and cefoxitin is recommended for isolation of pure cultures of the organism.

Curtis G. Gemmell

2507 Ensminger, P. W., Counter, F. T., Thomas, L. J. & Lubbehusen, P. P. (1982) **Susceptibility, resistance development, and synergy of antimicrobial combinations against** *Clostridium difficile. Current Microbiology* **7**(1), 59–62

2508 Fontaine, E. A. & Taylor-Robinson, D. (1981) **Evaluation of liquid transport media for the isolation of anaerobic bacteria: relevance to genital tract specimens.** *Journal of Infection* **3**(4), 360–369

A medium with tryptone, yeast extract, glucose, cysteine and dithiothreitol allowed the recovery of only 2 of 6 species of anaerobes from stored laboratory

mixtures; if 5% laked horse blood or 3% bovine serum (TYGBS) was added all 6 anaerobes, which included *Clostridium novyi* B, could be recovered; an increase in the amount of animal protein was deleterious. However, from men with non-gonococcal urethritis only 2 genera could be isolated after transport of swabs in TYGBS whereas if titanium trichloride complexed with citrate was added to the transport medium 6 genera were isolated.

[Much, including the heading of Table II, is confusing. The number of patients is not given and the single results cannot be allocated to one patient, many or the sum of all (Table III). It is asserted that TYGBS did not support growth; no evidence is given to validate this unlikely assertion.] *P. B. Crone*

2509 Landini, S., Coli, U., Lucatello, S. & Bazzato, G. (1981) **Plasma exchange in severe leptospirosis.** [Correspondence] *Lancet* **ii**(Nov. 14), 1119–1120

2510 Slots, J. (1982) **Selective medium for isolation of** *Actinobacillus actinomycetemcomitans*. *Journal of Clinical Microbiology* **15**(4), 606–609

VIROLOGY

2511 Lancet (1982) **i**(Feb. 6), 317–318. **Tumour viruses**

2512 Koprowski, H. (1982) **Unlearning about latency.** *Medical Microbiology and Immunology* **170**(4), 209–219 [29 references]

A review of latency and the relationships between viruses and host cells.

2513 Simons, K., Garoff, H. & Helenius, A. (1982) **How an animal virus gets into and out of its host cell.** *Scientific American* **246**(2), 58–66

The process is exemplified for Semliki Forest virus.

2514 Harmon, M. W. & Pawlik, K. M. (1982) **Enyme immunoassay for direct detection of influenza type A and adenovirus antigens in clinical specimens.** *Journal of Clinical Microbiology* **15**(1), 5–11

The authors describe a microplate double-antibody enzyme immunoassay (ELISA) to detect influenza and adenovirus antigens in clinical samples. The method detected 62% of the adenovirus and 53% of the influenza infections. These are much better results than have been achieved in earlier enzyme immunoassays. It is suggested that better specimen collection and processing would further improve this diagnostic method. *A. Voller*

2515 World Health Organization (1982) **Interferon therapy. Report of a WHO Scientific Group, Geneva, 1–4 March 1982.** *Technical Report Series 676* 28 pp. Geneva, Switzerland [ISBN 92 4 120676 4] [Sw.fr. 3.-]

". . . The Scientific Group concludes that: 'Interferons are not a panacea for the cure of human virus infections or cancer, and there is no case for their use at present except in properly controlled clinical trials."

2516 KLENK, H.-D., GARTEN, W., BOSCH, F. X. & ROTT, R. (1982) **Viral glycoproteins as determinants of pathogenicity.** *Medical Microbiology and Immunology* **170**(3), 145–153 [38 references]

VIRAL DISEASES

2517 STALDER, H. (1982) Virale Durchfälle. [**Viral diarrhoea**] *Schweizerische Medizinische Wochenschrift* **112**(15), 511–515 English summary

A review with 65 references.

2518 BIK, T., SAROV, I. & LIVNE, A. (1982) **Interaction between vaccinia virus and human blood platelets.** *Blood* **59**(3), 482–487

". . . This study demonstrates that although vaccinia virus lacks neuraminidase activity, it does bind to platelets and affects their function."

2519 PEUTHERER, J. F., SMITH, I. W. & ROBERTSON, D. H. H. (1982) **Genital infection with herpes simplex virus type 1.** *Journal of Infection* **4**(1), 33–35

"Herpes simplex viruses isolated from 215 patients (116 male, 99 female) in two study periods were typed as HSV-1 or HSV-2. Overall, 21·4 per cent of isolates were type 1; the proportion of type 1 isolates from females (31 per cent) was unchanged throughout, whereas the proportion from male patients rose from 5·7 to 16 per cent. In both sexes, most type 1 isolations were from young patients with primary infections."

[A study in Scotland.]

See also abstrs 2384, 2385.

2520 SPRUANCE, S. L., GOLDEN, C. A., KERN, E. R., KATZ, M. E. & CHOW, F.-S. (1982) **Typing of herpes simplex virus with type-specific human immunoglobulin M in an indirect immunofluorescence assay.** *Journal of Clinical Microbiology* **15**(2), 265–269

Following an earlier observation that some patients with primary herpes simplex infections produced IgM antibody that was specific for either type 1 or type 2 virus [see *Abstr. Hyg.* 1976, **51,** abstr. 179], the authors found 2 of 9 patients had IgM antibody specific for type 2 virus, and 1 had type 1-specific antibody. These patients were plasmaphoresed and their sera were tested for their ability to type 29 clinical isolates of herpes simplex virus in an indirect immunofluorescent antibody (IFA) assay. In comparative tests the IFA results agreed with those obtained by restriction endonuclease analysis of viral DNA in 27 cases; the other 2 isolates did not replicate well enough in the AV_3 cells used in the IFA test. Typing by replication in chick embryo cells produced one erroneous type 1 result, 2 indeterminate results and one in which inadequate viral replication prevented a result being obtained. The authors recommend the IFA test, using monospecific antisera, as a rapid, accurate, yet simple typing procedure. *E. A. Boulter*

2521 GRONOWITZ, J. S., KÄLLANDER, C. F. R., JEANSSON, S. & WALLIN, J. (1982) **Rapid typing of herpes simplex virus based on immunological specificity of viral thymidine kinase and typing according to sensitivity to iododeoxyuridine.** *Journal of Clinical Microbiology* **15**(3), 366-371

Iododeoxyuridine (IdU) inhibits type 1 herpes simplex virus more than type 2 virus. The authors have used this property to type 49 clinical isolates. They found complete agreement between IdU typing and another procedure (counterimmunoelectrophoresis) in 45 isolates; 3 other isolates gave an intermediate result in IdU typing; the remaining isolate, obtained from a patient treated with IdU, was a resistant type 1 mutant that was therefore incorrectly designated type 2 virus by the IdU test.

The virus-coded enzyme, thymidine kinase (dTK), is responsible for activating IdU to its inhibitory form inside the cell. As the two types of virus have immunologically distinct enzymes, the authors also developed a typing procedure based on the immunological inhibition of the enzymes by type-specific antisera. This procedure gave complete agreement with counterimmunoelectrophoresis in typing 19 of 20 clinical isolates; the other isolate was the dTK-negative mutant mentioned above. This procedure was also used on vesicle fluids from 13 patients. Results were obtained with 8 of these, of which 7 were confirmed by tests on viral isolates; the remaining fluid did not yield an isolate for confirmatory tests.

E. A. Boulter

2522 CLEVELAND, P. H., RICHMAN, D. D., OXMAN, M. N. & WORTHEN, D. M. (1982) **Rapid serological technique for typing herpes simplex viruses.** *Journal of Clinical Microbiology* **15**(3), 402–407

The authors describe a rapid method for typing isolates of herpes simplex virus that can be done with infected cells from a single roller tube culture, and is capable of automation. Filter-paper discs are placed in each well of 96-well flat-bottomed microplates; the bottom of each well contains a hole small enough to prevent liquid draining through unless suction is applied. Debris from a sonicated infected culture is adsorbed in the discs, followed by cross-adsorbed type-specific antisera and, finally, by ^{125} I-labelled staphylococcal protein A. The latter binds to the Fc portion of any antibody complexed to the viral antigen retained on the paper disc, and the bound radioactivity is then measured.

The procedure correctly identified 25 type 1 and 14 type 2 clinical isolates previously typed by both microneutralization and DNA hybridization procedures. A further 30 untyped isolates were resolved by the test into 10 type 1 and 20 type 2 viruses. The test clearly distinguished herpes simplex viruses from varicella-zoster and cytomegaloviruses. Results were available within 2 h of the first appearance of a cytopathic effect in primary culture. *E. A. Boulter*

2523 BURNS, W. H., SARAL, R., SANTOS, G. W. *et al.* (1982) **Isolation and characterisation of resistant herpes simplex virus after acyclovir therapy.** *Lancet* **i**(Feb. 20), 421–423

"Sensitivity of herpes simplex virus isolates to acyclovir became reduced in two bonemarrow transplant patients treated for established mucocutaneous infections. These isolates were thymidine-kinase-deficient mutants and were isolated within a week of discontinuation of a 1 week course of acyclovir therapy. The herpetic lesions in both patients continued to heal despite continued shedding of these viruses. Further studies and experience with this new class of antiviral agents are needed to determine the extent to which emergence of less sensitive virus will

present clinical difficulties and to formulate treatment regimens that will minimise the emergence of such mutants."

2524 De Clercq, E., Descamps, J., Ogata, M. & Shigeta, S. (1982) *In vitro* **susceptibility of varicella-zoster virus to *E*-5-(2-bromovinyl)-2′-deoxyuridine and related compounds.** *Antimicrobial Agents and Chemotherapy* **21**(1), 33–38

"The in vitro susceptibility of eight strains of varicella-zoster virus (VZV) to *E*-5-(2-bromovinyl)-2′-deoxyuridine (BVDU) was examined in human embryonic fibroblasts by the following techniques: inhibition of focus formation by either all-free VZV (4-day assay) or cell-associated VZV (2-day assay), inhibition of viral antigen formation (2-day assay), and inhibition of viral cytopathogenicity (15-day assay). The 50% inhibitory dose (ID_{50}) of BVDU ranged from 0·001 μg/ml (2-day assay) to 0·01 μg/ml (15-day assay). BVDU appeared highly selective in its anti-VZV activity since even at concentrations as high as 100 μg/ml, BVDU did not markedly affect the viability of the host cells. The ID_{50} of BVDU for VZV was comparable to that of IVDU (*E*-5-(2-iodovinyl)-2′-deoxyuridine). Both drugs inhibited the replication of VZV at a much lower concentration than did other antiviral compounds such as iododeoxyuridine, ethyldeoxyuridine, arabinosylcytosine, arabinosyladenine, phosphonoacetic acid, iododeoxycytidine, and acycloguanosine. BVDU and IVDU were virtually inactive against a thymidine kinase-deficient VZV mutant, suggesting that phosphorylation by the viral enzyme is responsible, at least in part, for the selective anti-VZV activity of the compounds."

2525 Etienne, J., Matillon, Y., Lehot, J. J. *et al.* (1982) **Discovery of cytomegalovirus in pericarditis fluid from a patient with neoplasm.** [Correspondence] *Infection* **10**(2), 102

2526 Glenn, J. (1981) **Cytomegalovirus infections following renal transplantation.** *Reviews of Infectious Diseases* **3**(6), 1151–1178 [185 references]

2527 Wingard, J. R., Stuart, R. K., Saral, R. & Burns, W. H. (1981) **Activity of trifluorothymidine against cytomegalovirus.** *Antimicrobial Agents and Chemotherapy* **20**(3), 286–290

"Trifluorothymidine (TFT) was tested for antiviral activity against mouse cytomegalovirus (MCMV) and human cytomegalovirus (HCMV) in one-step replication assays. The TFT concentration required to reduce virus yield by 50% (ID_{50}) was 0·22 μM for MCMV and 0·012 μM for HCMV. The antiviral activity of TFT against MCMV was reversed by addition of equimolar thymidine, and no antiviral activity was demonstrable in a host cell line lacking thymidine kinase [TK]. Thus, TFT's anti-MCMV activity is dependent on a host cell TK since this herpesvirus lacks thymidine kinase. A continuous subcutaneous infusion of TFT achieving a serum concentration of 1 μM failed to protect mice from lethal MCMV infection, perhaps because serum levels of thymidine were comparable to the drug level. Comparison of the ID_{50} against HCMV and the ID_{50} against human bone marrow progenitor cells resulted in an *in vitro* therapeutic ratio of 108, suggesting that TFT might offer some promise as a clinically useful anti-HCMV agent."

2528 Levine, P. H., Ebbesen, P., Connelly, R. R., Das, S., Middleton, M. & Mestre, M. (1982) **Complement-fixing antibody to Epstein-Barr virus soluble antigen in populations at high and low risk for nasopharyngeal carcinoma.** *International Journal of Cancer* **29**(3), 265–268

A new radiometric complement-fixation test was used to study the pattern of

antibodies to Epstein-Barr virus (EBV) capsid antigen and early antigen in 625 Greenland Eskimoes, a population with a very high incidence of nasopharyngeal carcinoma (NPC). In native Greenlanders, antibody levels were significantly higher in young (13 to 22 years) subjects than in older individuals. The levels in Eskimoes and in Danes living in Greenland were higher than in Danes living in Denmark; it remains to be seen whether these migrants from an area of low NPC incidence to one of high incidence and who develop high levels of EBV antibody are also at a higher risk of subsequently developing NPC. *R. N. P. Sutton*

2529 Lamy, M. E., Favart, A. M., Leclercq, M. F. *et al.* (1982) **Epstein-Barr virus VCA IgM and EBNA IgG antibodies titered by immunofluorescence in microplates. A semi-automated method based on microtiter system.** *Medical Microbiology and Immunology* **170**(4), 247–253

2530 Weekly Epidemiological Record (1982) **57**(6), 41–45. **Influenza in the world: October 1980–September 1981** [In English and French]

This report summarizes the impact of influenza throughout the world during the period 1980–1981. In Europe, outbreaks due to H1N1 influenza A viruses occurred in November in Hungary and the U.K. A second wave of activity began in December, mainly due to A/H3N2 viruses in Western Europe and to A/H1N1 or B viruses in Eastern Europe. 306 of 324 isolates of A/H3N2 virus reacted equally well with antisera to A/Texas/1/77 and A/Bangkok/1/79 viruses. Most A/H1N1 isolates were similar to A/England/333/80, but others were related to A/India/6263/80, A/Brazil/11/78 and A/USSR/90/77.

Few countries in Asia reported widespread influenza. More than half the isolates of A/H1N1 virus were related to A/England/333/80; most A/H3N2 isolates resembled either the A/Bangkok/1/79 or A/Texas/1/77 variants. Strains of influenza B virus produced only localized outbreaks and isolates were still closely related to the virus prevalent since 1979, B/Singapore/222/79.

Influenza was generally mild in South America, but in North America the season was the most severe experienced in the past 10 years. Strains of A/H3N2, which caused considerable mortality in North America, generally reacted equally well with antisera to A/Bangkok/1/79 and A/Texas/1/77 viruses. The most prevalent A/H1N1 isolates were related to A/England/333/80, but some A/India/6263/80-like strains were also found.

In Africa most influenza was due to A/H3N2 viruses that reacted with antisera to either A/Bangkok/1/79 or A/Texas/1/77 variants, or equally to both. A/H1N1 viruses resembling A/England/333/80 or A/India/6263/80 were isolated from sporadic outbreaks.

Influenza was generally mild in Oceania. Only sporadic cases were seen in Australia, but moderate activity was observed in New Zealand, and an outbreak occurred in Fiji. A/H1N1 isolates mostly resembled A/England/333/80, and A/H3N2 isolates, as elsewhere, reacted with antisera to A/Bangkok/1/79, A/Texas/1/77, or both. Influenza B viruses, similar to B/Singapore/222/79, became active towards the end of the season. *E. A. Boulter*

2531 Chu, C.-M., Tian, S.-F., Ren, G.-F., Zhang, Y.-M., Zhang, L.-X. & Liu, G.-Q. (1982) **Occurrence of temperature-sensitive influenza A viruses in nature.** *Journal of Virology* **41**(2), 353–359

Temperature-sensitive *(ts)* mutants can be induced in the laboratory by incubation of influenza virus with mutagenic chemicals and then selection for viruses that grow at 33 °C but not at 38 or 39 °C. These *ts* mutants have reduced virulence

for man and form the basis for one approach to live attenuated influenza vaccines. The present authors have searched for naturally occurring *ts* mutants. Only 1 of 12 strains of "old" H1N1 viruses isolated between 1949 and 1957 were *ts* whereas 13 of 17 strains of "new" H1N1 viruses isolated in 1977 were *ts*. Eight of 23 H3N2 strains isolated between 1968 and 1978 were *ts*, the figure increasing to 28 of 34 viruses isolated in 1979–80.

Some isolates were heterogeneous in *ts* property with clones showing various cut-off temperatures. Some *ts* strains were given to volunteers to establish whether they were attenuated. Four strains with a cut-off temperature of ⩽38 °C were attenuated, whereas 2 strains with a higher cut-off temperature of 39 °C and a non-*ts* strain were partially virulent. Thus, as with laboratory *ts* mutants, the *ts* character co-segregates with attenuation. Complementation tests with strains with known *ts* lesions in different genes established that the naturally occurring viruses had mutations in NP or M genes. We can conclude that viruses of different degrees of virulence occur in nature and this may have important epidemiological implications. *J. S. Oxford*

2532 Blok, J., Air, G. M., Laver, W. G. *et al.* (1982) **Studies on the size, chemical composition, and partial sequence of the neuraminidase (NA) from type A influenza viruses show that the *N*-terminal region of the NA is not processed and serves to anchor the NA in the viral membrane.** *Virology* **119**(1), 109–121

See also abstr. 2514.

2533 Goldwater, P. N., Webster, M. & Banatvala, J. E. (1982) **Use of a simple, new test for virus-specific IgM to investigate an outbreak of influenza B in a hospitalised aged community.** *Journal of Virological Methods* **4**(1), 9–18

The authors investigated an outbreak of influenza B in a psychiatric hospital, using a solid-phase immunosorbent haemadsorption (SPIHAd) assay capable of detecting specific IgM antibodies and other standard serological procedures. There were 63 cases [but only 58 according to Fig. 1] among 307 patients in 17 psychogeriatric wards, of whom 14 died; 15 nurses were also affected. Paired sera were collected from 19 patients and 4 nurses, and single specimens from a further 21 patients and 6 nurses. Of the 23 paired sera only 7 showed increased antibody titres to influenza B virus by haemagglutination-inhibition (HAI) and only 4 by complement-fixation but IgM antibodies were detected in 72·6% of the 73 available sera by the SPIHAd test or by HAI tests on IgM fractions obtained by sucrose density gradient filtration (SDGF/HAI). The SPIHAd test was positive in 71% of 63 sera, compared with only 56% of 57 sera tested by SDGF/HAI. In 27·5% of patients and 30% of the nurses a diagnosis could not be established by the serological tests used.

[This paper is marred by a number of typographical errors. In addition to that concerning Fig. 1 noted above, Table 1 is incorrectly referred to in the text as Table 2, and Table 2 as Table 3. Seven of 23 paired sera positive by the HAI test is said to be 80·4% instead of 30·4%.] *E. A. Boulter*

2534 Monto, A. S., Miller, F. D. & Maasab, H. F. (1982) **Evaluation of an attenuated, cold-recombinant influenza B virus vaccine.** *Journal of Infectious Diseases* **145**(1), 57–64

It is now recognized that influenza B virus (in addition to influenza A virus) can

cause deaths during epidemics. Also, the virus can cause considerable morbidity in schools, as for example in the influenza winter season just passed. The techniques and scientific method for producing cold-adapted (CA) viruses from influenza A viruses and subsequently recombinants with as many as possible of the genes from the CA parent are now being applied to influenza B viruses. B/Ann Arbor/1/66 was adapted to grow at 25 °C. Mixed infection of chick kidney cells at 25 °C with the CA parent and B/Hong Kong/8/73 in the presence of antiserum to B/AA/66 resulted in a recombinant (CR7) with the surface haemagglutinin and neuraminidase antigens of B/HK/73. The CR7 vaccine virus had a shut-off temperature of 37 °C and showed reduced (2 $\log_{10}$) replication in ferret nasal turbinates. In addition, mild patch pneumonia was detected in the lungs of ferrets inoculated with the B/HK/73 virus but no comparable effects were noted with the CR7. 154 volunteers were given 5–8 EID50 of CR7 (0·25 ml into each nostril) and 152 received a placebo solution. Temperatures and symptoms were recorded for 6 days. One symptom, sore throat, was more frequently reported among vaccinees than the control group (15·6% compared with 6·6% in the placebo group). 38% of volunteers had an increase in serum antibody to B/HK/72. In addition, virus was isolated from 6 individuals who did not show an increase in antibody. Therefore, a total of 46·8% of vaccinees showed evidence of infection.

About 4 months later a natural outbreak of influenza B virus occurred, antigenically related to B/Singapore/79. Nearly 11% of those who received the placebo were infected compared with 2·8% of vaccinees ($P < 0{\cdot}01$); 2 vaccinated persons (1·4%) also had respiratory illness, whereas 5·7% of the placebo group had clinical signs of infection ($P < 0{\cdot}05$). Further studies are now needed with recombinants containing genes coding for current influenza B haemagglutinin and neuraminidase surface antigens. *J. S. Oxford*

2535 Zlydnikov, D. M., Kubar, O. I., Kovaleva, T. P. & Kamforin, L. E. (1981) **Study of rimantadine in the USSR: a review of the literature.** *Reviews of Infectious Diseases* **3**(3), 408–421 [91 references]

"The results of basic-science and clinical studies performed in the USSR with the drug rimantadine are summarized. In the investigations cited, the therapeutic and prophylactic efficacy of rimantadine against infection with influenza virus was tested, and rimantadine was shown to be clinically efficacious and free of toxicity, both in studies with volunteers and in persons with natural disease during epidemics of influenza. Administration of 50 mg of the drug for 15–30 days was effective for prevention of influenza, and administration, early in the course of illness, of dosage of 150 mg per day for three to five days resulted in a favorable clinical response. The combination of immunization and chemoprophylaxis was shown to be highly effective for the prevention of influenza."

2536 Morbidity and Mortality Weekly Report (1982) **31**(6), 65–67. **School immunization requirements for measles—United States, 1982**

As 72% of cases of measles in the U.S.A. were in school-age children in 1980, a major goal for the measles elimination programme has been to attain high rates of immunization in schoolchildren. A means for achieving this goal has been the requirement that all children on school entrance should show evidence of measles immunity (this does not apply to children already in school). A second law requires all children attending school to show such evidence of measles immunity. In 1979, 18 states, including the District of Columbia, had comprehensive

school-attendance laws requiring evidence of measles immunity, but by January 1982, 40 states had such a law. Ten states have a school-entry law and one state a law for elementary-school attendance. A striking example of the effect of the law is that Pennsylvania, which has no law, had 20% of the cases of measles in the U.S. in 1981, whereas it has only 5% of the population. [The Centers for Disease Control with the aid of these laws seem to be on course for the elimination of indigenous measles in the U.S.A. towards the end of 1982.] *A. J. Beale*

2537 Friedman, M. G. (1981) **A population screening test for antibody to measles virus.** *Israel Journal of Medical Sciences* **17**(11), 1045–1050

"In areas where sporadic cases of measles continue to occur in spite of vaccination programs, the availability of a simple screening test for determination of seropositivity to measles virus is desirable. A sensitive radioimmunoassay (RIA) screening test (ST) for the detection of IgG antibody to measles virus, based on a solid phase RIA, is described. The assays were performed on polyvinyl microtiter plates for which the RIAST requires only 5 μl of serum per subject. Antigen consisted of a sonicated extract of measles virus-infected Vero cells. Rabbit antihuman IgG specific for the Fc-segment of human IgG, labeled with ^{125}I, was used to detect human IgG bound to viral antigen. The basic RIA method was characterized by carrying out full titrations of sera of 53 healthy adults, 10 children, and 13 patients with measles-associated illness. These sera were also tested by the hemagglutination inhibition (HI) technique; most of the measles sera were also tested by complement fixation (CF). RIAST results (expressed as binding ratios) obtained for 52 healthy adults are compared with their RIA serum titers. Of the 200 sera of patients of various ages tested by the RIAST, 63 borderline sera were also tested by HI. The RIAST, which does not require serum treatment other than inactivation, proved to be more sensitive as an indicator of seropositivity than HI. Implications of the results and practical applications of the screening test are discussed."

2538 Ter Meulen, V., Löffler, S., Carter, M. J. & Stephenson, J. R. (1981) **Antigenic characterization of measles and SSPE virus haemagglutinin by monoclonal antibodies.** *Journal of General Virology* **57**(2), 357–364

"Hybrid cells secreting monoclonal antibodies directed against the haemagglutinin (H) protein of measles virus (Edmonston) were produced by fusion of mouse myeloma cells with spleen cells derived from immunized mice. Measles antibodies secreted by these cells were tested for their ability to react with measles virus in immunoprecipitation experiments and assays of binding, neutralization, haemagglutination inhibition and haemolysin inhibition. On this basis 21 out of 75 hybridomas could be defined and divided into five functional groups with different properties. However, when tested against other measles virus strains, including those isolated from subacute sclerosing panencephalitis (SSPE) patients, normalized radioimmunoassay (RIA) binding titres showed that the extent to which a given antibody bound could vary greatly with the virus strain examined. Moreover, the biological actions within a group were found to be very heterogeneous, even when high antibody binding titres were observed. These results suggest that different measles virus strains, which are not distinguishable by polyvalent sera, do in fact possess antigenic differences. Furthermore, the functional significance of a given virus epitope may vary from strain to strain. Hybridoma antibodies were also used to demonstrate the occurrence of antigenic changes within the H polypeptide of SSPE virus during the course of a non-productive, persistent infection *in vitro*."

2539 Zanello, A. & Traverso, A. (1982) Considerazioni sul particolare neurotropismo del virus della parotite nella epidemia del periodo dicembre 77–giugno 78. **[Considerations on the peculiar neurotropism of the parotitis virus in the 1977/78 epidemic]** *Giornale di Malattie Infettive e Parassitarie* **34**(2), 184–186 English summary

A report of 10 cases from northern Italy.

2540 Burkhardt, F., Schilt, U. & Andres, R. Y. (1982) Virologische Diagnostik der Mumps-Infektion: ein festphasen-Radioimmuntest zum Nachweis mumpsspezifischer IgM-Antikörper (MACRIA). **[Virological diagnosis of mumps infection: a solid-phase radioimmunoassay for the detection of mumps-specific IgM antibodies (MACRIA)]** *Schweizerische Medizinische Wochenschrift* **112**(18), 638–643 English summary

2541 Heinz, F., Plesník, V., Chobot, S. & Kupec, V. (1982) Virologická surveillance akutních respiračních onemocnění. **[Virological surveillance of acute respiratory diseases in North Moravia in the winter period 1978–79]** *Československá Epidemiologie, Mikrobiologie, Imunologie* **31**(1), 1–8 English summary

From investigations of 524 people in this one area of Czechoslovakia it was clear that there was no significant epidemic of influenza in the winter of 1978–79 but among the 41% of cases in which a virus was identified as the aetiological agent a high proportion of respiratory syncytial virus was found, 30%, particularly among children younger than 6 years old. *D. W. FitzSimons*

See also abstr. (2401)

2542 Gilmore, D., Robinson, E. T., Gilmour, W. H. & Urquhart, G. E. D. (1982) **Effect of rubella vaccination programme in schools on rubella immunity in a general practice population.** *British Medical Journal* **284** (Feb. 27), 628–630

Altogether 141 patients, aged between 13 and 22 years, who attended a general practice in Glasgow were tested for rubella immunity by the single radial haemolysis test. The seronegative rate of the women who should have been vaccinated at 13 years of age and that of the men who were not vaccinated were found to be about the same. This indicates that the rubella vaccination programme had failed in this practice and the authors therefore suggest that rubella immunity of all girls should be checked at 15 years of age and those found to be susceptible should be revaccinated before they leave school. *L. Ho*

2543 AvRuskin, T. W., Brakin, M. & Juan, C. (1982) **Congenital rubella and myxedema.** *Pediatrics* **69**(4), 495–496

". . . We report a patient with childhood myxedema and congenital rubella, and indicate that myxedema may occur as a sequela to rubella. . . ."

2544 Ter Meulen, V., Siddell, S. & Wege, H. [Editors] (1981) **Biochemistry and biology of coronaviruses. Proceedings of an international symposium, University of Würzburg, West Germany, October 1980.** *Advances in Experimental Medicine and Biology Vol. 142* pp. x + 438. Plenum Press, 233 Spring Street, New York, N.Y. 10013, U.S.A. [ISBN 0 306 40806 6] [U.S. $49.50]

The elucidation of the morphology of viruses by electron microscopy has revealed relationships that might have taken years to appreciate by other techniques. A good example of this is the coronavirus group. These viruses are distributed across a wide range of hosts, including man. They share a common morphology of the virion, *viz.* an irregular central body with a very characteristic halo (corona) of rounded projections. This beginning has led in turn to an intensive study of their chemical composition, replication, serological relationships and epidemiology. This book, edited by Professor ter Meulen and his colleagues, comprises the papers given at a conference on coronaviruses held at Würzburg in the autumn of 1980, and includes two summarizing chapters by B. W. J. Mahy (*Biochemistry of Coronaviruses 1980,* p. 261) and D. A. J. Tyrrell (*Biology of Coronaviruses 1980,* p. 419) respectively. Books culled from conferences tend to be uncoordinated, with some ground covered twice and other parts left out, and too often they date easily. However, although a good deal of water must have flowed under the coronavirus bridges since 1980, this symposium will inevitably save much looking up of material widely scattered in journals (where no doubt, by now, much of it will have been published anyway) both for the initiated and for the novice.

The coronaviruses are a group which has attracted many kinds of virologist. To clinicians they are troublesome, to epidemiologists enigmatic, to molecular biologists extremely interesting. They are pathogens commanding respect, particularly in veterinary medicine, and their epidemiology, for example the apparent ease with which they can cross species barriers, is yet to be unravelled. Ultimately, all the facts of their replication and pathogenesis are to be explained in terms of molecular biology, and it must be admitted that this is what occupies, rightly, the bulk of the volume. For example, it appears that, in contrast to the alphaviruses, the coronaviruses direct the synthesis of separate messenger RNAs for each structural protein, as opposed to having a single subgenomic messenger RNA. As D. Stern, L. Burgess, S. Linesch and I. Kennedy write (p.190) "The mechanism by which these several transcriptive events are performed and regulated should prove to be of particular interest". The proteins, too, have been well characterized, and particular interest attaches to glycoprotein E1 of murine coronavirus A59, studied by H. Niemann and H. D. Klenk at Giessen (p.119) which appears to be synthesized by a different pathway and in a different cell compartment from the other glycoproteins. Perhaps most interesting of all, and as yet relatively ill-understood, are the non-structural viral proteins.

The suggestion (p.424) that virologists should concentrate on a few, or perhaps only one, agent, as did the phage virologists of the 1950s, is hardly likely to be taken up, when so much work is under way on viruses of different species. Indeed, the comparisons involved may themselves be of considerable methodological value. All in all, this is a valuable, if inevitably rough-hewn, work, and one senses that the days in October 1980 at the Institute of Virology and Immunobiology at Würzburg were well spent. *A. P. Waterson*

2545 Siddell, S., Wege, H. & Ter Meulen, V. (1982) **The structure and replication of coronaviruses.** *Current Topics in Microbiology and Immunology 99,* 131–163 [161 references]

2546 Wege, H., Siddell, S. & Ter Meulen, V. (1982) **The biology and pathogenesis of coronaviruses.** *Ibid.,* 165–200 [287 references]

2547 Weekly Epidemiological Record (1982) **57**(20), 153–154. **Enterovirus diseases surveillance: Coxsackie type A16** [In English and French]

Two reports of outbreaks of disease due to Coxsackie viruses are given. The first describes an outbreak of hand, foot and mouth disease in Singapore, the largest ever recorded in the country, in 1981: from August to 15 November 617 cases were reported. Epidemiological investigations were made of 270 cases, mostly in children aged between 1 and 4 years, 83 secondary cases and a further 80 secondary cases in families of home contacts. All patients recovered spontaneously. Coxsackie virus type A16 was isolated from 12 of 23 swabs.

The second records an epidemic due to Coxsackie virus type B2 in England in 1981; 427 cases were recorded. Epidemics seem to recur every 3 years: in 1967 there were 592 reports, in 1970–71 there were 695 reports (in 2 years), in 1974–75 there were 428 reports and in 1978 there were 391; in intervening years the virus does not disappear—a few cases were still reported. Most of the cases in 1981 were in children under 5 years and 5 of 13 infected neonates died. Meningitis and encephalitis accounted for only 52 of 413 cases (13%). Altogether 12 patients died of Coxsackie virus B2 infection in 1981. *D. W. FitzSimons*

2548 Townsend, T. R., Bolyard, E. A., Yolken, R. H. *et al.* (1982) **Outbreak of Coxsackie A1 gastroenteritis: a complication of bone-marrow transplantation.** *Lancet* **i**(Apr. 10), 820–823

"In a three-week period 7 of 14 transplant recipients were infected with coxsackie A1 virus. Diarrhoea and mortality were significantly associated with infection (7 of 7 infected compared with 0 of 7 non-infected, and 6 of 7 infected compared with 1 of 7 non-infected, respectively). Early in the outbreak, the diarrhoea was presumed to be due to acute graft-versus-host disease (AGVHD). However, the distribution of AGVHD among infected and non-infected patients was nearly equal, and at necropsy 3 of 6 infected patients who had had diarrhoea showed no evidence of gastrointestinal involvement with AGVHD. Infection with viral enteric pathogens may be an important factor in the clinical course of transplant recipients."

2549 Payne, C. M., Ray, C. G. & Yolken, R. H. (1981) **The 30- to 54-nm rotavirus-like particles in gastroenteritis: incidence and antigenic relationship to rotavirus.** *Journal of Medical Virology* **7**(4), 229–313

The authors describe rotavirus-like virus particles in the stools of 17 children with gastroenteritis. As a result of morphological and immunological tests, enzyme-linked immunosorbent assay and immune electron microscopy, they conclude they are rotaviruses. They were antigenically similar to rotavirus type 2 and therefore the authors caution against ascribing new names for stool viruses on size and morphological criteria alone. *A. J. Beale*

2550 Zamotin, B. A., Libiyainen, L. T., Bortnik, F. L. *et al.* (1981) **[Water-borne group infection of rotavirus aetiology]** *Zhurnal Mikrobiologii, Epidemiologii i Immunobiologii* (11), 100–102 [In Russian] English summary

This is a report on the suspected water-borne origin of rotavirus infections. In March-April, 173 cases were registered in one settlement. All bacteriological

investigations were negative. Rotavirus was demonstrated in 10 out of 24 stools, and neutralizing antibody to rotavirus was demonstrated in 21 paired sera with titres of between 1 in 4 and 1 in 64. No neutralizing antibody was found in 9 paired sera. In 6 cases virus as well as neutralizing antibody was present in the stools.

The age distribution of patients is interesting: 0–7 years 10·4%; 7–14 years 11·6%; 20–29 years 17·3%; 30–39 years 26·0%; 40–49 years 24·3%, adults being mainly affected.

Clinically, the disease presented as mild diarrhoea. The methods used in the virological investigations are not documented. *K. Apostolov*

2551 Prévot, J. & Guesdon, J. L. (1981) **A lectin immunotest using erythrocytes as marker (Erythro-LIT) for detection and titration of rotavirus antigen.** *Annales de Virologie* **132E**(4), 529–542

A new test procedure for the detection of rotaviruses is described. It uses specific antibody to the virus absorbed to the wells of a microtitre plate to capture the viral antigen. Such antigen is revealed by red blood cells which bind to a lectin, wheat-germ agglutinin, to which specific antibody has been covalently bound with glutaraldehyde. The resulting material will specifically adhere to virus bound to antibody on the wells. The optimal amount of lectin-labelled IgG was 1 μg in buffer containing *N*-acetylglucosamine. A 0·5% concentration of sheep red cells was optimal. In this test a blocking test was necessary using specific antisera or normal antisera added to the viral suspension before addition to antibody-coated wells. The method was about as sensitive as an enzyme immunoassay detecting 5 ng of purified rotavirus antigen. Also it was as sensitive in the examination of 52 stool samples and both tests were more sensitive than electron microscopy. *A. J. Beale*

2552 Matsuno, S., Inouye, S., Hasegawa, A. & Kono, R. (1982) **Assay of human rotavirus antibody by immune adherence hemagglutination with a cultivable human rotavirus as antigen.** *Journal of Clinical Microbiology* **15**(1), 163–165

The immune adherence haemagglutination test system for rotavirus antibodies was used with the Wa strain of human rotavirus which grows in MA–104 cells in the presence of 5 μg/ml trypsin. The test was about 8-fold more sensitive than complement fixation and proved a simple, reliable and rapid method for the detection of rotavirus antibodies. *A. J. Beale*

2553 Kogasaka, R., Nakamura, S.-I., Chiba, S. *et al.* (1981) **The 33- to 39-nm virus-like particles, tentatively designated as Sapporo agent, associated with an outbreak of acute gastroenteritis.** *Journal of Medical Virology* **8**(3), 187–193

During an outbreak of non-bacterial gastroenteritis in an orphanage in Sapporo, Japan, in December 1979 a Norwalk-like virus was detected by electron microscopy. 43 out of 54 residents were affected and a virus was detected in 17 out of 35 stool samples. The virus, called Sapporo agent, was antigenically similar to Otofuke agent, described by Taniguchi *et al.* [*Abstr. Hyg.* 1981, **56,** abstr. 1826]. The virus was small and round and morphologically distinguishable from rota– and calici-viruses and, at 33–39 nm in diameter, larger than enteroviruses. It was like Norwalk virus but rather larger. *A. J. Beale*

2554 Hodges, J. R., Millward-Sadler, G. H. & Wright, R. (1982) **Chronic active hepatitis: the spectrum of disease.** *Lancet* **i**(Mar. 6), 550–552

"A five-year study of all newly diagnosed cases of chronic active hepatitis (CAH) from a defined population of 404 000, in which the internationally accepted diagnostic criteria were applied, is reported. A putative aetiological agent was identified in all but 14 (23%) of 61 cases. Alcohol (26%) and hepatitis B (20%) were the commonest aetiological factors. The incidence of CAH was 3 per 100 000 per year. Patients were often elderly, mean age 56, with a third aged over 65. A third were symptom-free at diagnosis, and the disease was biochemically or histologically severe in only a few. 9 of 61 (15%) fulfilled the criteria for treatment used in the Mayo Clinic trials. Even after exclusion of those with CAH unresponsive to corticosteroids (i.e., where hepatitis B, drugs, or alcohol are involved in the aetiology) and widening of the criteria, only 7 of the remaining 31 (23%) are likely to benefit from corticosteroids. The variety of aetiological agents, spectrum of clinical features, and range of disease severity are very different in an unselected group from those reported from specialised referral centres."

2555 Gilmore, I. T., Harrison, J. M. & Parkins, R. A. (1981) **Clustering of hepatitis B virus infection and hepatocellular carcinoma in a family.** *Journal of the Royal Society of Medicine* **74**(11), 843–845

The occurrence of primary hepatocellular carcinoma (HCC) in a 55-year-old Chinese man led to an investigation of his family members. The patient himself had HBsAg, anti-HBc and anti-HBe in his blood. His father had died at 63 from liver disease and his mother was still living at 83 in China. There were 7 siblings of whom 4 were traceable in South Africa and the U.K. One appeared to have died in 1973 of HCC. His hepatitis B status remained unknown. From 2 other siblings blood was obtained and one showed anti-HBs and the other anti-HBc. The fourth traceable sibling in the U.K. was HBsAg- and HBeAg-positive; although symptom-free it appeared after thorough clinical examination that he was developing HCC.

The relationship between the HCC and the positive serological findings for hepatitis B infection is discussed and the authors make some suggestions for the correlation, which could hardly occur by chance. More of these relationships were encountered earlier by other workers but laboratory tests for hepatitis B were not always available. *B. Hofman*

2556 Masera, G., Locasciulli, A., Jean, G. *et al.* (1981) **Hepatitis B and childhood acute lymphoblastic leukemia.** *Journal of Pediatrics* **99**(1), 98–100

There are reports in the literature suggesting that the course of leukaemia may be favourably affected by bacterial infections and by viral hepatitis. On the other hand, it is well established that patients with leukaemia and other diseases associated with immunodepression are frequently persistent carriers of hepatitis B surface antigen.

A retrospective review of the outcome of acute lymphoblastic leukaemia in 43 children treated at a hospital in Milan between 1968 and 1972 revealed that the chance of survival was increased significantly in children who had hepatitis B. The diagnosis of hepatitis B was based on insensitive serological tests available at the time. This observation is difficult to explain. It is possible that a persistent viral infection could, at least theoretically, exert a modulatory effect on the immune system resulting in an antileukaemic effect. *A. J. Zuckerman*

2557 Vorozhbieva, T. E., Purevdavaa, E., Farber, N. A. *et al.* (1982) **[Hepatitis B antigens (HBs and HBe) and antibody to them in patients with viral hepatitis, in pregnant women and newborn infants in the Mongolian People's Republic]** *Voprosy Virusologii* (1), 53–57 [In Russian] English summary

"The presence of HB surface antigen and antibody to it was studied in 516 patients with acute viral hepatitis, convalescents, and patients with chronic liver diseases, 613 pregnant women, and 265 newborn babies using the gel precipitation test, and some of them (747 persons) by the reverse passive hemagglutination (RPHA) test. A high rate of HBs findings was observed both in patients with acute viral hepatitis (54·2%, RPHA) and in convalescents and patients with chronic liver diseases (44·9%, RPHA). Despite wide occurrence of hepatitis B virus carrier state among pregnant women (10·1%, RPHA), the rate of infection in newborn babies was only 0·6% by RPHA. The data are also presented on the distribution of the main subtypes of HBs and HBe antigens and antibody to them in the observed groups of patients and carriers."

2558 Ascione, A., Forte, G. B., Amitrano, L. *et al.* (1981) **Serological markers of hepatitis B virus infection in healthy volunteer blood donors in Campania (southern Italy).** *Vox Sanguinis* **41**(3), 146–150

Sera from 2084 healthy volunteer blood donors in Naples were tested by radioimmunoassay for hepatitis B surface antigen, surface antibody and anti-core. The prevalence of markers of hepatitis B virus in the entire group was 51·2%, but the incidence of each single marker varied considerably.

The surface antigen was found overall in 5·3% and its incidence increased sharply in people aged between 20 and 30 years, followed by a significant decrease in older people. Surface antibody was found alone in 1·7% of the donors and its occurrence increased significantly with increasing age. Anti-core was found alone in 10·8% of the donors with a statistically significant increase with age up to the fifth decade. Surface antibody and core antibody were present simultaneously in 33·3% of the donors with a constant incidence in the various age-groups.

The significance of anti-core alone is difficult to explain. The titres of this antibody investigated in a random sample of 120 donors were low, suggesting that the sera were unlikely to contain surface antigen in detectable amounts.

The important conclusion from this study is that the infection rate with hepatitis B virus in the Naples area of southern Italy is much higher than that reported for other Western countries. *A. J. Zuckerman*

2559 Picciotto, A., Crovari, P., Crovari, P. C., De Flora, S., Dodero, M. & Celle, G. (1981) **Interplay of cell and serum immunologic markers in chronic persistent or active hepatitis B.** *Journal of Medical Virology* **8**(3), 195–200

δ Antigen and δ antibody were found more frequently in patients with chronic active hepatitis in Italy than in non-Italians. Hepatitis B surface antigen and core antigen were not detected in the hepatocytes of a significant number of patients with chronic active hepatitis, whereas anti-*e* was always found in their sera. This contrasted with the frequent detection of intracytoplasmic surface antigen in chronic persistent hepatitis, especially in the absence of core antigen in the same biopsy specimens.

Both the *e* antigen and anti-*e*, and δ antigen and δ antibody were related to the age of the patients. The *e* antigen was found more frequently in younger patients, whereas anti-*e* was commoner in patients over 30. Although almost all the patients

with δ antigen or antibody had circulating anti-*e*, their mean age was under 30 years and this was significantly lower than in patients without δ markers. This suggests that superinfection with the δ agent occurs in patients infected with hepatitis B virus at an early age.

A peculiar aspect of the δ system is its geographical distribution, and the results of the present study confirm the marked prevalence of δ antigen and anti-δ in patients originating from southern rather than from northern or central Italy, which contrasts with the homogeneous distribution of *e* antigen and anti-*e*.

A. J. Zuckerman

2560 Rizzetto, M., Morello, C., Mannucci, P. M. *et al.* (1982) **Delta infection and liver disease in hemophilic carriers of hepatitis B surface antigen.** *Journal of Infectious Diseases* **145**(1), 18–22

The δ antigen is associated with hepatitis B infection and appears to be a transmissible virus which is dependent on a helper function of hepatitis B virus for its replication. Epidemiological and infectivity studies have shown that δ antigen is transmitted by parenteral infection of carriers of hepatitis B surface antigen (HBsAg), and that expression of δ antigen in the liver correlates with the development of hepatitis (for review see leading article, *Lancet* 1982, **i,** 259).

The prevalence of infection with the δ agent was studied in 277 treated patients with haemophilia (average age 21 years) in 2 centres in Italy and in 2 centres in the U.S.A. and in 24 treated children with haemophilia in Italy. All the patients were multiply transfused with clotting factor concentrates, most of which were obtained commercially. It was found that haemophiliac carriers of HBsAg are at high risk of δ infection. Antibody to δ was found in 14 (49%) out of 29 HBsAg-positive adolescent or adult haemophiliacs and in 4 (25%) out of 16 HBsAg-positive children with haemophilia. Anti-δ was not identified in any of the patients without serological evidence of exposure to hepatitis B virus but it was found, in low titre, in only 4 (3%) out of 187 HBsAg-negative patients with hepatitis B surface antibody. On the basis of histology and/or biochemical abnormalities, it was determined that 10 (56%) out of 18 HBsAg-positive patients with haemophilia and anti-δ had chronic liver disease. Liver biopsies from 5 such patients had the histological features of chronic active hepatitis, and direct evidence of replication of δ antigen, as demonstrated by intrahepatic expression of the antigen, was found in 2 out of 3 biopsies. Thus, the serological profile of patients with haemophilia with anti-δ suggests that their liver disease was predominantly caused by co-infection with the δ agent, the pathogenic potential of which has been demonstrated in other studies (see *ibid.,* above), rather than by infection with hepatitis B virus.

Recognition that patients with haemophilia with hepatitis B surface antigenaemia are at high risk of superinfection with the δ agent and probably liver disease makes it important to prevent their exposure to the δ agent. Plasma units are now tested for HBsAg by very sensitive techniques and positive units are excluded from clotting-factor concentrates. It is unlikely that additional screening for δ markers would identify δ-infected donors, since δ-positive patients tested to date invariably have circulating HBsAg, and are excluded from giving blood. It is postulated that superinfection with δ in haemophiliacs is transmitted in blood containing both δ antigen and HBsAg in quantities that are undetectable by the most sensitive assays currently available. Paradoxically, the low amount of HBsAg might render such blood/plasma units non-infective ordinarily, yet such units may prove highly infective for individuals with established carriage of HBsAg because this condition provides a rescue function for replication of the δ antigen. The authors suggest that the use of clotting-factor preparations obtained from a single

or only a few donors may be the only feasible means of preventing superinfection with δ agent and liver disease in haemophiliacs with persistent hepatitis B surface antigenaemia.
A. J. Zuckerman

2561 Raimondo, G., Smedile, A., Gallo, L., Balbo, A., Ponzetto, A. & Rizzetto, M. (1982) **Multicentre study of prevalence of HBV-associated delta infection and liver disease in drug-addicts.** *Lancet* **i**(Jan. 30), 249–251

The prevalence of δ infection in serum and in the liver was studied in symptomless drug addicts in Italy and in addicts with clinical hepatitis in Italy, Denmark, Switzerland and Ireland in order to assess the epidemiological and pathogenic effects of δ infection in addicts who take drugs parenterally.

Antibody to δ was found by radioimmunoassay in 9 (27%) out of 33 asymptomatic HBsAg carrier drug addicts and in 13 (8%) out of 156 drug addicts with hepatitis B surface antibody, but in none of those without hepatitis B markers. The prevalence of δ antigen or its antibody in the serum of drug addicts with clinical hepatitis B was 104 (64%) out of 161 patients in Italy, 8 (44%) out of 18 in Denmark, 11 (33%) out of 33 in Switzerland, and 15 (31%) out of 49 addicts in Ireland. The δ antigen was detected by immunofluorescence in 32 (40%) out of 79 liver biopsies from addicts with clinical hepatitis B.

Thus, concurrent infection with the δ agent is common in drug addicts with hepatitis B infection, and it is possibly a major cause of liver disease, as shown by the prevalence of anti-δ in 27% of asymptomatic HBsAg carrier addicts in Italy and by the finding of δ markers in 31 (64%) addicts with hepatitis B in different parts of Europe.

The authors conclude that since in industrial countries addicts are the only persons exposed to blood/plasma which had not been screened for HBsAg and thus not for the δ agent, the use of illicit drugs is presumably the major means by which the δ agent is disseminated to areas of Western countries where its infection is not endemic. If drug addiction is not controlled, addicts will be the major victims and reservoir of the δ agent in Western communities. The results obtained in the course of this investigation suggest that this may already be the case.
A. J. Zuckerman

2562 Stöcklin, E., Gudat, F., Bianchi, L., Schmid, M. & Stalder, G. A. (1982) Delta-Antigen bei Hepatitis B. [**δ-Antigen in hepatitis B**] *Schweizerische Medizinische Wochenschrift* **112**(15), 521–523

"Among 571 liver biopsies delta-Ag was found in 10 of 365 HBsAg positive patients (9 with CAH, 1 with CPH). Delta-Ag was demonstrated in nuclei and cytoplasm of liver cells in both cryostat and paraffin sections. Follow-up studies revealed persistence of delta-Ag for as long as 6 years and temporary appearance or loss of Dane particle-associated parameters without a change in the concomitant inflammation. These findings are compatible with the hypothesis that delta-Ag represents a defective viral agent which modulates, by superinfection, the typical viral expression patterns of HBV infection."

2563 Liu, S.–S., Lian, C.–F., Hao, F.–Y. & Zheng, C.–X. (1982) **Preparation and clinical use of HBsAg immune RNA.** *Lancet* **i**(Jan. 23), 197–198

This report from Inner Mongolia, People's Republic of China, describes the results of treating 50 patients suffering from chronic persistent hepatitis B with immune RNA administered intradermally once or twice weekly for 6 months; 21

patients with the same disease were treated with inactivated immune RNA and served as a control group.

The immune RNA was prepared from the spleens and lymph nodes of horses immunized with purified hepatitis B surface antigen. The ability of immune RNA to transfer specific cellular immunity was measured by the leucocyte adherence inhibition test.

After treatment, the surface antigen (as measured by reverse passive haemagglutination) was not detectable in 20% of the treated patients for at least 3 months. There was a significant clinical response and at least a 3-fold decrease in the titre of the surface antigen in another 60% of the patients. There was a concomitant fall in the level of serum alanine aminotransferase. Similar improvement was detected in only a few of the control patients receiving inactivated immune RNA.

[Although there are several apparent defects in the design of the study, the results appear promising.] *A. J. Zuckerman*

2564 Sacks, S. L., Scullard, G. H., Pollard, R. B., Gregory, P. B., Robinson, W. S. & Merigan, T. C. (1982) **Antiviral treatment of chronic hepatitis B virus infection: pharmacokinetics and side effects of interferon and adenine arabinoside alone and in combination.** *Antimicrobial Agents and Chemotherapy* **21**(1), 93–100

"In an uncontrolled trial, 29 patients with chronic hepatitis B virus infection were treated with 93 courses of adenine arabinoside at doses ranging from 2·5 to 15 mg/kg per day. Most patients were treated concomitantly with human leukocyte interferon. Significant, but transient, neurotoxicity was seen with adenine arabinoside therapy in 44% of all courses. Manifestations of toxicity were mainly neurological and ranged from pain syndromes to tremors and, rarely, seizures. Suppression of numbers of lymphocytes was also noted. All effects were reversible with time. The extent of toxicity was dependent upon the dosage of adenine arabinoside. Treatment with interferon appeared to potentiate the occurrence of toxicity with adenine arabinoside. Arabinofuranosylhypoxanthine serum levels increased in a dose-dependent manner and tended to accumulate in interferon-treated hepatitis patients during a course of therapy. Elevated blood levels and drug accumulation were associated with toxicity in a significant fashion. Human leukocyte interferon was administered to 38 patients in 113 separate courses. Interferon side effects were rapidly reversible upon cessation of therapy. These included initial fever, myalgias, and hair loss as well as suppression of granulocytes, platelets, and lymphocytes in the blood."

2565 Kessler, H. A., Dixon, J., Howard, C. R., Tsiquaye, K. & Zuckerman, A. J. (1981) **Effects of amphotericin B on hepatitis B virus.** *Antimicrobial Agents and Chemotherapy* **20**(6), 826–833

"We investigated the effects of amphotericin B (AmB) on the ultrastructure and biochemistry of hepatitis B virus (HBV) and hepatitis B surface antigen (HBsAg) particles. These effects were compared with those reported for AmB and other polyene antibiotics on other lipid-enveloped viruses and artificial membranes. Treatment of HBV particles with concentrations of AmB ranging from 5 to 250 μg/ml resulted in (i) an increase in HBV deoxyribonucleic acid polymerase activity as the concentration of AmB increased; (ii) changes in the electron microscopic apppearance of HBV ranging from increased penetration of negative stain into the lipid envelope to disruption of the virus; and (iii) an increase in density from 1·165 to 1·225 g/ml. In addition, AmB treatment of

HBsAg particles resulted in disruption into a nonparticulate HBsAg-reactive fraction and an HBsAg-AmB complex fraction with no HBsAg immunoreactivity."

2566 Bréchot, C., Hadchovel, M., Scotto, J. *et al.* (1981) **State of hepatitis B virus DNA in hepatocytes of patients with hepatitis B surface antigen-positive and -negative liver diseases.** *Proceedings of the National Academy of Sciences of the U.S.A.* **78**(6), 3906–3910

The Southern blot transfer-hybridization technique (*Journal of Molecular Biology* 1975, **98,** 503) provides a very sensitive method for the detection of viral DNA. Using a slight modification of this technique, the authors examined the DNA immobilized on nitrocellulose paper by hybridization with cloned hepatitis B virus DNA (HBV DNA) as a probe labelled with ^{32}P by the nick-translation procedure. Viral DNA was found to be integrated into cellular DNA in both liver tumour and non-tumour tissue in patients with primary hepatocellular carcinoma, as demonstrated by hybridization of high molecular weight DNA after digestion with *Hind*III and *Eco*R1 endonucleases. Integrated HBV DNA was also found in patients with cirrhosis with or without chronic active hepatitis. Free HBV DNA was found in the liver in 2 patients with chronic persistent hepatitis and in 1 patient with chronic active hepatitis. The intense smear in the gel with an upper limit at the 3.2 kb position after digestion with *Hind*III indicates a large quantity of free HBV DNA in the liver, and this may be the result of viral multiplication and molecular heterogeneity due to the single-stranded region of the viral DNA which is of variable length. However, free viral DNA in large amounts may be trapped in the host DNA during electrophoresis, causing smearing throughout the track which may mask the presence of any small amount of integrated DNA. Restriction-endonuclease patterns in 2 patients with acute hepatitis B strongly suggested integration of the HBV DNA. When confirmed by the examination of a large number of patients with acute hepatitis B, viral integration seems to occur early in the course of infection.

[These are important observations which are difficult to follow easily owing to poor editorial assistance with English. Table 1, however, is an excellent summary of the results.] *A. J. Zuckerman*

2567 Cohen, B. J. & Richmond, J. E. (1982) **Electron microscopy of hepatitis B core antigen synthesized in** *E. coli.* [Correspondence] *Nature,* London **296**(Apr. 15), 677–678

2568 Place, J. D. & Schroeder, H. R. (1982) **The fixation of anti-HBsAg on plastic surfaces.** *Journal of Immunological Methods* **48**(2), 251–260

Solid-phase immunoassays have now come into routine use for detection of hepatitis B surface antigen. This paper describes a modification of the usual passive-absorption methods: the capture antibody (anti-HBs) is fixed on to the microplates with glutaraldehyde or ethyl chloroformate. This reduces the desorption from the plastic surface but does not affect the sensitivity of the assays. *A. Voller*

2569 Garoff, H., Kondor-Koch, C. & Riedel, H. (1982) **Structure and assembly of alphaviruses.** *Current Topics in Microbiology and Immunology* **99,** 1–50 [196 references]

2570 UMENAI, T., WATANABE, M., SEKINO, H. *et al.* (1981) **Korean hemorrhagic fever among rural residents in Japan.** *Journal of Infectious Diseases* **144**(5), 460–463

In this paper the authors produce evidence to show that Korean haemorrhagic fever (KHF) is endemic in rural areas in Japan. Four clinically diagnosed patients and 7 out of 14 family contacts who had never complained of symptoms of KHF were proved serologically to have been infected with the KHF virus. Furthermore the seropositivity appeared to correlate with age with regard to covert infections.

Information was given by these people that the wild rodent population in their areas had increased. Sera from the wild rodents *Apodemus speciosus* (2 out of 2) and *Microtus montebelli* (3 out of 3) were found to have KHF antibodies. The antigens of KHF virus were detected by fluorescent antibody techniques in lung tissue sections of *A. speciosus* (1 out of 6) and *M. montebelli* (2 out of 9). Five *Rattus norvegicus* were investigated but no evidence of KHF virus infection was found.

The authors conclude that in rural Japan KHF is endemic and the findings strongly suggest that natural reservoirs of the KHF virus are the wild rodents *A. speciosus* and *M. montebelli.*

[See also *Abstr. Hyg.* 1979, **54,** abstr. 3882.] *E. E. Vella*

2571 MÁLKOVÁ, D., HOLUBOVÁ, J., KOLMAN, J. M. *et al.* (1982) Protilátky vůči některým arbovirům přenášeným klišťaty a viru Ťettnang u lidí, kteří překonali různé neuropatie. **[Antibodies against some arboviruses transferred by ticks and against Tettnang virus in patients previously affected by various neuropathies]** *Československá Epidemiologie, Mikrobiologie, Imunologie* **31**(1), 15–20

"A total number of 408 patients were examined. In this number 215 patients with established diagnosis of tick-borne meningoencephalitis had antibodies against the 'TE' [tick-encephalitis] virus in 29·7%, against the virus Tribeč in 5·6%, against the Eyach virus in 9·3% and against the Tettnang virus in 1·9%. In 109 patients with the diagnosis of meningitis, antibodies against the TE virus were found in 18·3%, against the Tribeč virus in 5·5%, against the Eyach virus in 5·5% and against the Tettnang virus in 0·9%. In 16 cases with the diagnosis of meningopolyneuritis, antibodies were found only against the Eyach virus in three patients. In 38 patients previously affected by polyradiculoneuritis with occasional meningoencephalitic complications, antibodies against the Tribeč virus were found in one case and those against the Eyach virus in six cases. In the other patients there were solitary antibody findings against the viruses examined. In five patients with the diagnosis of pharyngitis with meningoencephalitic complications, seroconversion against the Tettnang virus was found in one case. Antibodies against the Uukuniemi virus were not found in any of the examined sera. The relationship between the antibody findings and the affections of the examined persons is discussed."

2572 FRISCH-NIGGEMEYER, W. (1982) **A solid-phase radioimmunoassay for quantitative measurement of class-specific antibodies against tick-borne encephalitis virus.** *Journal of Virological Methods* **3**(6), 319–328

The author has developed a solid-phase radioimmunoassay for the quantitation of IgG and IgM antibodies in human sera against tick-borne encephalitis (TBE) virus. Both the high class specificity and the sensitivity of the procedure were dependent upon the use of very highly purified anti-γ and anti-μ globulins.

Problems of non-specific reactivity caused by rheumatoid factor (RhF) were overcome by incorporating a blocking test in which guineapig anti-TBE serum was used. The false positive results were detected by their failure to become negative in the presence of anti-TBE serum. Such sera were then treated to remove RhF before the test was repeated. *E. A. Gould*

2573 Beaty, B. J., Casals, J., Brown, K. L. *et al.* (1982) **Indirect fluorescent-antibody technique for serological diagnosis of La Crosse (California) virus infections.** *Journal of Clinical Microbiology* **15**(3), 429–434

Paired sera from patients with encephalitis associated with La Crosse virus infection were tested by haemagglutination inhibition, complement fixation, neutralization and also by an indirect immunofluorescent technique. The immunofluorescent test was sensitive and IgM antibodies were detectable in 48% of patients. However, these antibodies declined over the succeeding years.

R. N. P. Sutton

2574 Horzinek, M. C. (1981) **Non-arthropod-borne togaviruses.** pp. ix + 200. Academic Press Inc. (London) Ltd, 24–28 Oval Road, London NW1 7DX [ISBN 0 12 356550 2] [£16.40]

This is another title in the series on Experimental Virology published by Academic Press. These volumes are intentionally about the viruses themselves, and the material is presented from the laboratory point of view. This one comes up to the standard of its predecessors. Disguised under the somewhat cumbersome title is a well-presented and well-documented monograph on a series of viruses, represented in human medicine principally by rubella, and in veterinary medicine by—among others—hog cholera virus, bovine diarrhoea virus, and border disease virus of sheep. These are dealt with systematically from the point of view of the properties of the virion, virus–cell interactions, and genetics. The members of the group are dealt with under each of these headings, and it is open to question whether it would have been better to treat rubella on its own, and the other viruses subsequently and separately. However, the comparative approach which the author has adopted proves, on reading, to be an effective one and has a few surprising outcomes. For example, it is interesting that carrot mottle virus "shows more resemblance to animal togaviruses than to any other plant virus". One day, the complete sequencing of the genomes may yield findings with surprising implications for viral origins and viral relationships.

The book is an expensive one, but it will prove an invaluable reference work, particularly in veterinary laboratories. *A. P. Waterson*

2575 Ono, K., Ogasawara, M., Ohashi, A. *et al.* (1982) **Inhibitory effects of various 5-halogenated derivatives of 1-β-D-arabinofuranosyluracil 5′-triphosphate on DNA polymerases from murine cells and oncornavirus: substituent effects on inhibitory action.** *Biochemistry* **21**(5), 1010–1024

CHLAMYDIAL DISEASES

2576 Brunham, R. C., Martin, D. H., Kuo, C.-C. *et al.* (1981) **Cellular immune response during uncomplicated genital infection with** *Chlamydia trachomatis* **in humans.** *Infection and Immunity* **34**(1), 98–104

"A lymphocyte transformation (LT) assay for the study of the cellular immune response to *Chlamydia trachomatis* in humans is described. Subjects studied

included 9 newborns whose mothers were *C. trachomatis* culture negative, 16 seronegative, sexually inexperienced adults, and 107 patients seen at a sexually transmitted disease clinic, including 31 men presenting with acute nongonococcal urethritis and 76 women with known or suspected uncomplicated gonorrhea or with uncomplicated *C. trachomatis* genital infection. LT stimulation indices (SI) were less than 3·5 in newborns and normal adults, as well as 11 of 12 seronegative, isolation-negative sexually transmitted disease clinic subjects. LTSI greater than 3·5 was found only with subjects who were sero- or culture positive for *C. trachomatis*. Among men with nongonococcal urethritis, the LTSI correlated better with culture than with antibody. Among women, the LTSI correlated better with antibody than with culture. LTSI declined significantly 3 to 4 weeks after curative therapy in men with nongonococcal urethritis, suggesting that LT response is short-lived and that the LTSI may be an indicator of acute *C. trachomatis* infection. The sensitivity, specificity, and predictive value of a positive LT assay and of serum and local antibody tests, in terms of *C. trachomatis* infection defined as positive isolation, were also compared. The predictive value of a positive LTSI for *C. trachomatis* infection was generally low in the sexually transmitted disease clinic patients: 62% in men with nongonococcal urethritis and 37% in women. However, the study did show the LT assay to be a useful specific test for monitoring the cellular immune response to *C. trachomatis* infection."

2577 Miller, B. R., Arthur, J. D., Parry, W. H., Perez, T. R. & Mosman, P. L. (1982) **Atypical croup and** *Chlamydia trachomatis*. [Correspondence] *Lancet* **i**(May 1), 1022

The authors describe a case of a $3\frac{1}{2}$-year-old boy with croup. *Chlamydia trachomatis* was isolated from subglottic exudate, as well as *Staphylococcus aureus*. Treatment with erythromycin was successful.

The authors ask whether "bacterial tracheitis" (the initial diagnosis) is really caused by *Staph. aureus* or is a synergistic infection with *Staph. aureus* and *C. trachomatis* or with *C. trachomatis* primarily and *Staph. aureus* as a commensal. They also ask whether *C. trachomatis* is involved in typical croup.

D. W. FitzSimons

2578 Skaug, K., Otnaess, A.-B., Orstavik, I. & Jerve, F. (1982) **Chlamydial secretory IgA antibodies in human milk.** *Acta Pathologica, Microbiologica et Immunologica Scandinavica* **90C**(1), 21–25

"Colostrum from 10 of 30 randomly chosen women contained IgA antibodies to *Chlamydia trachomatis* as shown by an enzyme-linked immunosorbent assay and a single-antigen immunofluorescence test. Specific colostral IgA was present only in seropositive women. In addition, chlamydial-specific IgA was also detected in milk from 5 of 6 women who were shown to harbour *C. trachomatis* in the lower genital tract during delivery. There was a close correlation between chlamydial-specific IgA and the chlamydial secretory immunoglobulin titres in colostrum and milk samples but not between chlamydial IgA titres and the total secretory IgA content. No agreement was observed between the specific IgA antibodies in milk and corresponding serum samples. It is suggested that chlamydial-specific IgA in milk is induced by genital infections."

2579 Lascolea, L. J. Jr & Baldigo, S. M. (1982) **Infectivity of** *Chlamydia trachomatis* **in tissue culture with newborn calf serum.** *Journal of Clinical Microbiology* **15**(5), 951–953

The authors recommend that newborn calf serum (NCS) should not be used as

a replacement for fetal bovine serum for the isolation of *Chlamydia trachomatis* in tissue culture. NCS is relatively inexpensive but its use had a detrimental effect on the quality and quantity of cytoplasmic inclusions.

[Although this is stated to be a preliminary investigation, it is a pity that only a single batch of serum from each source was tested.] *Carolyn A. Brown*

2580 Wachendörfer, G. & Lohrbach, W. (1982) Säugetier-Chlamydien: neuere Erkenntnisse zur Humanpathogenität. **[Mammalian chlamydiae: recent information on human pathogenicity]** *Münchener Medizinische Wochenschrift* **124**(6), 127–130 English summary

This is a review, with 47 references, of mammalian chlamydiae which have been shown to cause human disease. The longest known condition is ornithosis/psittacosis but the spectrum of human illness due to mammalian chlamydiae is wide and includes infection of the eyes, respiratory tract, urogenital tract and an influenza-like disease. In animals it is a cause of abortion, pneumonia, eye infection and orchitis. The mechanism of transmission is not fully understood but is likely to be due to contact with and inhalation of infected material. The importance of inapparent infection of mammals in causing human disease is not known. *G. W. Csonka*

2581 Price, M. E. & Harrison, B. D. W. (1982) **Restrictive pattern of lung function following psittacosis treated with corticosteroids.** *British Journal of Diseases of the Chest* **76**(2), 199–201

A report of a case.

RICKETTSIAL DISEASES

2582 Tobin, M. J., Cahill, N., Gearty, G. *et al.* (1982) **Q fever endocarditis.** *American Journal of Medicine* **72**(3), 396–400

Ten cases of Q fever endocarditis in Dublin, Ireland, are described. The patients' average age was 43 years and their sex ratio was equal. Only 4 had a history of possible environmental exposure to Q fever. The patients all had valvular lesions. Six presented with a febrile illness and the other 4 with congestive cardiac failure. Nine had hepatosplenomegaly with abnormal liver function tests, 7 (of 8 tested) had thrombocytopenia and 7 had microscopic haematuria.

In every case the diagnosis was made serologically with elevated antibody titres to Phase 1 and Phase 2 antigens of *Coxiella burneti.* Antibiotic therapy consisted of tetracycline and lincomycin in 4 cases, tetracycline and co-trimoxazole in 3, tetracycline in 2, and co-trimoxazole in 1 case. Five patients died. The authors recommend that clinicians should consider the diagnosis of Q fever endocarditis in all culture-negative cases of endocarditis, as it may be frequently missed. [In view of the relatively recent outbreak of Q fever endocarditis in Wales this certainly seems a logical conclusion.] *T. S. J. Elliott*

2583 Kokorin, I. N., Kabanova, E. A., Shirokova, E. M., Abrosimova, G. E., Rybkina, N. N. & Pushkareva, V. I. (1982) **Role of T lymphocytes in *Rickettsia conorii* infection.** *Acta Virologica* **26**(1/2), 91–97

A study in mice.

MYCOPLASMAL DISEASES

2584 Razin, S. [Guest Editor] (1981) **Mycoplasma infections. International Symposium held at the Hebrew University of Jerusalem, 19–21 May 1981.** *Israel Journal of Medical Sciences* **17**(7), 509–686

In this symposium several different areas in mycoplasmology were reviewed, namely infections specifically of man, farm animals, cell cultures, plants and arthropods, in addition to aspects of adherence and pathogenicity, mycoplasma-induced arthritis and other host reactions, chemotherapy, immunization and vaccine development. The discovery of a new mycoplasma in the genital tract of men with non-gonococcal urethritis is recounted and it is pointed out that it has many features that indicate that it is a pathogen, including its ability to adhere to eukaryotic cells. Indeed, the general importance of adherence in the pathogenicity of mycoplasmas is considered in some detail. The tenacious attachment of mycoplasmas to cells in culture is one of the reasons for the difficulty in eliminating them. Thus a discussion of ways of detecting mycoplasmas and a novel way of killing them in cell culture based upon differences between the nucleic acid metabolism of mycoplasmas and that of tissue culture cells is of particular interest. Mycoplasmas are well known for causing arthritis in a variety of animal species, including man, although in the latter it was pointed out that there is still no evidence that they are a cause of rheumatoid disease and that mycoplasma-induced arthritis has been seen only in hypogammaglobulinaemia and subsequent to *Mycoplasma pneumoniae* infections. The latter is an important pathogen capable of inducing autoimmunity. That autoimmune phenomena may be stimulated by mycoplasmas which have acquired host antigens was discussed and evidence for such acquisition presented. Perhaps the elimination of mycoplasmas from tissue cultures presents a problem no greater than that of eliminating them from animal breeding stocks and preventing mycoplasmal disease in animals and humans. The problems surrounding the use of vaccines as a means of doing this are given some thought.

The proceedings are worth reading because, without being lengthy, they focus on much of the current thinking in these areas. Moreover, the material is not out of date since, almost unbelievably, the proceedings were published only 2 months after the symposium took place. *David Taylor-Robinson*

2585 Hu, P. C., Cole, R. M., Huang, Y. S. *et al.* (1982) *Mycoplasma pneumoniae* **infection: role of a surface protein in the attachment organelle.** *Science,* Washington **216**(Apr. 16), 313–315

"Attachment of *Mycoplasma pneumoniae* to host cells by means of a specialized terminus initiates infection. Monoclonal antibodies to a surface protein (P1) inhibit this process, and react with a region of the tip covered with peplomer-like particles. Since antibodies against the P1 protein are generated by natural and experimental infection and by immunization, the substance may be an important determinant of protective immunity. . . . These data support the possibility that surface protein components of *M. pneumoniae* might be useful as vaccines."

2586 Krause, D. C., Leith, D. K., Wilson, R. M. & Baseman, J. B. (1982) **Identification of** *Mycoplasma pneumoniae* **proteins associated with hemadsorption and virulence.** *Infection and Immunity* **35**(3), 809–817

FUNGAL DISEASES AND GENERAL DERMATOLOGY

2587 MAIBACH, H. I. & ALY, R. [Editors] (1981) **Skin microbiology; relevance to clinical infection.** pp. xiv + 354. Springer-Verlag, 175 Fifth Avenue, New York, N.Y. 10010, U.S.A. [ISBN 0 387 90528 6] [U.S.$45.70]

This is an up-to-date and comprehensive review of developments since 1965 in various clinical aspects of the field of skin microbiology. Although a comprehensive statement of the current knowledge of this subject is desirable there are some drawbacks to the present volume.

The book suffers from the differences in style and presentation occasioned by the large number (49) of contributors. Because of this, and despite some attempt to group chapters into 6 parts according to content, many chapters can be read and digested independently of the others. Additionally, several chapters have been poorly positioned and a change in the order of material would have improved the book. Further, the limitations of reviewing a subject involving rapidly expanding knowledge, new techniques and the like are that much of the information and opinions will be inaccurate, dimly perceived and, by the time the book has reached many foreign libraries, obsolete. This must be taken into account during reading.

The first part consists of 9 chapters relating to the cutaneous flora and its control. It includes the taxonomy and new information about the major groups of skin microorganisms and factors affecting their colonization of the skin. The early chapters describe the currently confused taxonomy of the corynebacteria and the *Staphylococcus–Micrococcus* group. Also in this part are chapters on the newer methods of quantification, a useful chapter of albeit still inaccurate methods, the treatment of nasal carriers of coagulase-positive staphylococci (a chapter which perhaps could have been better placed later in the book) and an interesting contribution on microbial interactions and antibiosis and the attempts that have been made to exploit natural antibiosis by pre-treatment with microorganisms to prevent colonization by pathogens.

Part 2 contains 10 chapters on topical skin antibacterial agents. The first contains some very interesting observations on the best way to run clinical trials and interpret the results of those run by others. Chapters on the effectiveness of shower baths with and without disinfection and the use of pre-operative whole body disinfection to prevent post-operative wound infection are included. Antimicrobial soaps and newer germicides are also dealt with but there is little mentioned on the current usage of true antibiotics in skin microbiology and the attendant hazard of the development of drug resistance.

Part 3 contains one chapter on *in vitro* adherence of *Staph. aureus* to nasal epithelial cells, which could have been better placed in Part 1.

The chapters in Part 4, broadly on infection and epidemiology, vary greatly in subject matter. There are reviews on the interaction of bacteria and fungi in athlete's foot, the nature of staphylococcal scaled skin syndrome, the experimental induction of cutaneous infections, the importance of hands in nosocomial infections caused by Gram-negative bacteria and the infection of burn wounds and its prevention. There is also a chapter on neonatal bacterial colonization which omits discussion of the sources of skin organisms and the relationship between this and the type of delivery.

Part 5 contains 2 chapters on the taxon *Propionibacterium acnes* and its involvement in acne.

Part 6 includes 4 chapters on the treatment of skin infections by topical and other methods and more specifically deals with the treatment of serious cutaneous staphylococcal and streptococcal infections and mucocutaneous candidiasis.

This book should be read by those wanting to obtain the current views of the

clinical aspects of skin microbiology but more effort could have been expended in its presentation. This, however, should not prejudice its use or comprehension by the foreign student. *P. Barrow*

See also abstr. 2326.

2588 Hariri, A. R., Hempel, H. O., Kimberlin, C. L. & Goodman, N. L. (1982) **Effects of time lapse between sputum collection and culturing on isolation of clinically significant fungi.** *Journal of Clinical Microbiology* **15**(3), 425–428

See also abstrs (2295), 2296.

2589 Scherwitz, C. (1982) **Ultrastructure of human cutaneous candidosis.** *Journal of Investigative Dermatology* **78**(3), 200–205

2590 De Vries-Hospers, H. G., Mulder, N. H., Sleijfer, D. T. & Van Saene, H. K. F. (1982) **The effect of amphotericin B lozenges on the presence and number of *Candida* cells in the oropharynx of neutropenic leukemia patients.** *Infection* **10**(2), 71–75

". . . On the basis of our findings [in 77 patients], we conclude that topical treatment of the oropharynx area with amphotericin B lozenges should be strongly recommended in patients prone to *Candida* infections. . . ."

2591 Casal, M. & Linares, M. J. (1981) **The comparison of six media for chlamydospore production by *Candida albicans*.** *Mycopathologia* **76**(2), 125–128

2592 Akgün, Y. & Akşit, F. (1981) Candida tropicalis'e Bağli üriner kandidiazis olgusu. [**A case of urinary candidiasis due to *Candida tropicalis***] *Mikrobiyoloji Bülteni* **15**(2), 110–111 English summary

2593 Shaff, M. I., Berger, J. L. & Green, N. E. (1982) **Cryptococcal osteomyelitis, pulmonary sarcoidosis, and tuberculosis in a single patient.** *Southern Medical Journal* **75**(2), 225–226

2594 Kwon-Chung, K. J., Hill, W. B. & Bennett, J. E. (1981) **New, special stain for histopathological diagnosis of cryptococcosis.** *Journal of Clinical Microbiology* **13**(2), 383–387

A new application of the Masson-Fontana stain for melanin is described, in which the potential of *Cryptococcus neoformans* to synthesize melanin-like compounds in its cell wall is used to demonstrate this species in tissue sections. The walls of a range of other fungal pathogens were not stained. *C. K. Campbell*

2595 Graybill, J. R., Straus, D. C., Nealon, T. J., Hague, M. & Paque, R. E. (1982) **Immunogenic fractions of *Cryptococcus neoformans*.** *Mycopathologia* **78**(1) 31–39

2596 Ushijima, T., Takahashi, M. & Ozaki, Y. (1981) **Selective and differential media for isolation and tentative identification of each species of *Pityrosporum* residing on normal or diseased human skin.** *Microbiology and Immunology* **25**(11), 1109–1118

2597 Sinski, J. T., Van Avermaete, D. & Kelley, L. M. (1981) **Analysis of tests used to differentiate *Trichophyton rubrum* from *Trichophyton mentagrophytes*.** *Journal of Clinical Microbiology* **13**(1), 62–65

Statistical evaluation of the accuracy of various tests in use for distinguishing *Trichophyton rubrum* from *T. mentagrophytes* revealed that none was as effective as the standard *in vitro* hair-penetration test. A combination of this test and the use of potato-carrot agar culture is recommended by the authors as the best procedure for identification of strains intermediate in morphology between the two species.

C. K. Campbell

2598 Çolak, H. & Yuluğ, N. (1982) Aspergillus ve kronik akciğer hastaliklari. **[Aspergilli and chronic lung diseases]** *Microbiyoloji Bülteni* **16**(1), 17–21

"In this study [in Turkey], mycological examinations of morning sputum of patients with chronic bronchitis and bronchial asthma has been performed. Specimens were also examined from patients with lobar pneumonia as a control. *Aspergillus fumigatus* and *A. niger* have been isolated from patients with chronic bronchitis in frequency of 4·5% and 0·8% respectively. These 2 fungi have also been isolated from patients with bronchial asthma in frequency of 24·5% (*A. fumigatus*) and 2·4% (*A. niger*). The frequency of isolation of *A. fumigatus* has been found statistically significant between these two groups of patients ($P < 0·05$). No isolation of *Aspergillus* spp. has been noted in control patients' specimens."

2599 Greenberger, P. A. & Patterson, R. (1982) **Application of enzyme-linked immunosorbent assay (ELISA) in diagnosis of allergic bronchopulmonary aspergillosis.** *Journal of Laboratory and Clinical Medicine* **99**(2), 288–293

"IgE and IgG antibodies against Af [*Aspergillus fumigatus*] were measured by ELISA in sera from 15 patients with ABPA and compared with antibody levels in six patients with extrinsic asthma and immediate-type skin reactivity to Af (prick skin test 3+ or 4+) but no other evidence for ABPA. The assay used polyvinyl microhemagglutination plates as a solid phase to adsorb antigens of Af and a double-antibody system of class-specific anti-human globulin and alkaline phosphatase-conjugated goat anti-rabbit globulin. IgE-Af and IgG-Af were significantly greater among patients with ABPA than in patients with asthma, suggesting that this assay may be used as an important diagnostic aid. The advantages of ELISA over radioimmunoassay are discussed in regard to early detection of an indolent pulmonary disease."

2600 Robertson, S. A., Kimball, P. L. & Magtibay, L. Z. (1982) **Pulmonary blastomycosis diagnosed by cytologic examination of sputum.** *Canadian Medical Association Journal* **126**(4), 387–388

The authors describe the case of a 63-year-old man who presented with a chronic cough and haemoptysis and X-ray changes consisting of infiltrates in the left upper lobe. A presumptive diagnosis of pulmonary tuberculosis was made.

However large thick-walled yeasts with broadbased buds were seen in Papanicolaou-stained smears. *Blastomyces dermatitidis* was subsequently isolated from the sputum. The patient was successfully treated with amphotericin B.

This report reemphasizes the importance of simple procedures such as the examination of direct preparations of sputum in the diagnosis of systemic fungal infections. The morphology of the organisms is often distinctive and direct examination of infected material may lead to a presumptive diagnosis. This should be confirmed subsequently with culture and serological tests. *R. J. Hay*

2601 Recht, L. D., Davies, S. F., Eckman, M. R. & Sarosi, G. A. (1982) **Blastomycosis in immunosuppressed patients.** *American Review of Respiratory Disease* **125**(3; Pt 1), 359–362

2602 Nishimoto, K. (1981) **Chromomycosis in Japan.** *Annales de la Société Belge de Médecine Tropicale* **61**(3), 405–412

"Chromomycosis cases in Japan up to 1979 are briefly reviewed. They are found in all groups, and males and females are equally infected. Lesions are not restricted to the lower extremities but are also located on upper parts of the body. Invasion of visceral organs and/or lymphnodes has been found in 10 cases. The brain may be invaded (13 cases confirmed by autopsy and 2 doubtful cases). The most prevalent causative species is *Phialophora pedrosoi* but a relatively frequent isolation of *Phialophora (Wangiella) dermatitidis* is characteristic."

2603 Downey, E. F. Jr (1982) **Asymptomatic pleural effusion in histoplasmosis: case report.** *Military Medicine* **147**(3), 218–219

PROTOZOAL DISEASES

2604 Conroy, M. S. (1982) **Malaria in late Tsarist Russia.** *Bulletin of the History of Medicine* **56**(1), 41–55

2605 Martinez, A. J. & De Jonckheere, J. F. (1981) Les infections par les amibes libres. **[Infections due to free-living amoebae]** *Bulletin de l'Institut Pasteur* **79**(2), 171–205

A detailed review with 160 references.

See also abstr. 2294.

2606 Dhu, P. (1982) **Effect of antimalarial drugs on** *Naegleria fowleri.* [Correspondence] *Medical Journal of Australia* **1**(1), 13

The effects of antimalarials and some other drugs against two Australian strains of *Naegleria fowleri* were tested *in vitro.* Although the growth rate was halved at concentrations of chloroquine, quinine and pyrimethamine achievable *in vivo,* only amphotericin B was effective in killing the organisms. Sulphonamide (25

μg/ml) was ineffective. These results agree with observations of the lack of effect of antimalarials and sulphonamides in human cases of primary amoebic meningoencephalitis [*Abstr. Hyg.* 1982, **57,** abstr. 1037]. *D. C. Warhurst*

2607 Haight, J. B. & John, D. T. (1982) **Varying the serum component in axenic cultures of** *Naegleria fowleri. Proceedings of the Helminthological Society of Washington* **49**(1), 127–134

2608 Ioli, A., Gaglioti, P., Ceccarelli, G. & Faraone, U. (1980) [received 1982] Esperienza di trattamento della giardiasi mediante tinidazolo. **[Treatment of giardiasis with tinidazole]** *Rivista di Parassitologia* **41**(3), 315–318 English summary

An investigation on 791 children between 3 and 5 years old, from "maternal homes" in the province of Catanzaro in Calabria, Italy, showed 50 of them to be faecal carriers of *Giardia lamblia.* They were treated with a single dose of tinidazole (Fasigin) at 50 mg/kg, given after a meal. Seven tests were made thereafter for up to 30 days. 96% of the children were found free from *Giardia* at the first examination on the 3rd day after treatment. Two showed rare cystic forms on the 6th day. One child who had been negative on the 12th day after treatment was positive on the 15th. Many of the patients vomited after taking the tablets. Tinidazole did not clear concurrent infections with *Hymenolepis, Trichuris trichiura* or *Enterobius.* Apart from vomiting and nausea, no side effects were seen. *E. Agius*

2609 Grabowski, E. F., Giardina, P. J. V., Goldberg, D. *et al.* (1982) **Babesiosis transmitted by a transfusion of frozen-thawed blood.** *Annals of Internal Medicine* **96**(4), 466–467

A report of a case due to *Babesia microti* in a splenectomized woman who had not travelled to known endemic areas; one of the blood donors was found to be seropositive, had been in an endemic area and had had contact with ticks.

HELMINTHIASES

2610 Mura, I., Romano, G., Ginanneschi, R. & Peckmann, A. (1981) L'idatidosi umana in provincia di Sassari: indagine epidemiologica nel periodo 1975–80. **[Human hydatid disease in Sassari Province, Italy: epidemiology for the period 1975–80]** *Nuovi Annali d'Igiene e Microbiologia* **32**(3), 159–177

". . . During the period considered, in 535 subjects affected by hydatidosis of whom only 345 had undergone surgery, the incidence of hydatidosis was found to be equivalent to an average yearly rate of 23·5 and 15·2, respectively, per 100,000 inhabitants.

"The highest specific rate per group of population was observed in retired persons ($77{\cdot}4/10^5$), in farmers and shepherds (39·1), workmen (24·0) and housewives (17·8).

"57% of the subjects were male, in more than 65% the cysts were found in the liver, in 25% in the lung and in 9·5% in other organs. Hepatic localization prevailed in adult groups and pulmonary localization in children, in young men, and in shepherds.

"35 out of 345 operated subjects (10·1%) underwent more than one surgical operation, up to a maximum of six, with an interval, between the first and the second operation, of less than 1 year in 68% of cases."

2611 Van Thiel, P. H. & Bakker, P. M. (1981) Wormgranulomen in de maag in Nederland en in Japan. **[Worm granulomas of the stomach in the Netherlands and in Japan]** *Nederlands Tijdschrift voor Geneeskunde* **125**(34), 1365–1370

Anisakiasis (herringworm disease caused by *Anisakis simplex*) has largely been eliminated in the Netherlands. However, the disease may become a problem again owing to increased travel to Japan, where the infection can be contracted by the consumption of raw or insufficiently cooked fish. In the Netherlands, intestinal anisakiasis used to be prevalent, whereas in Japan the gastric form is more common.

Histopathological/anatomical observations were carried out on a worm granuloma and adenocarcinoma of the stomach of a patient operated on for perforation of the stomach. A study followed to determine whether other worms might produce gastric granulomas, taking advantage of a locus minoris resistentiae in the stomach. The authors fear that the "nouvelle cuisine" in the Netherlands may introduce *Phocanema, Contracaecum* or *Diploscapter coronata* infections, causing this type of gastric problem. *Rosemary Rogers*

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INDEX OF FIRST AUTHORS OR SOURCES

(Numbers shown are those of abstracts. Abstract numbers in brackets indicate articles cited by title only.)

INDEX OF FIRST AUTHORS OR SOURCES—*continued from p. iii*

ANNUAL INDEXES

Progress is being made in reducing the delay in the production of annual indexes (authors and subjects) for *Abstracts on Hygiene*. Those for 1979 (volume **54**) appeared in November 1981 and it is hoped that those for 1980 will be published by the autumn of 1982.

It is hoped in due course to achieve a target date of October for the production of indexes for the volume of *Abstracts on Hygiene and Communicable Diseases* published in the previous year.

SUBJECT INDEX

Numbers refer to abstracts and not to pages (unless otherwise shown). Abstract numbers in brackets indicate articles cited by title only. Book review numbers are in **bold** type.

[Continued on p. 3 of cover